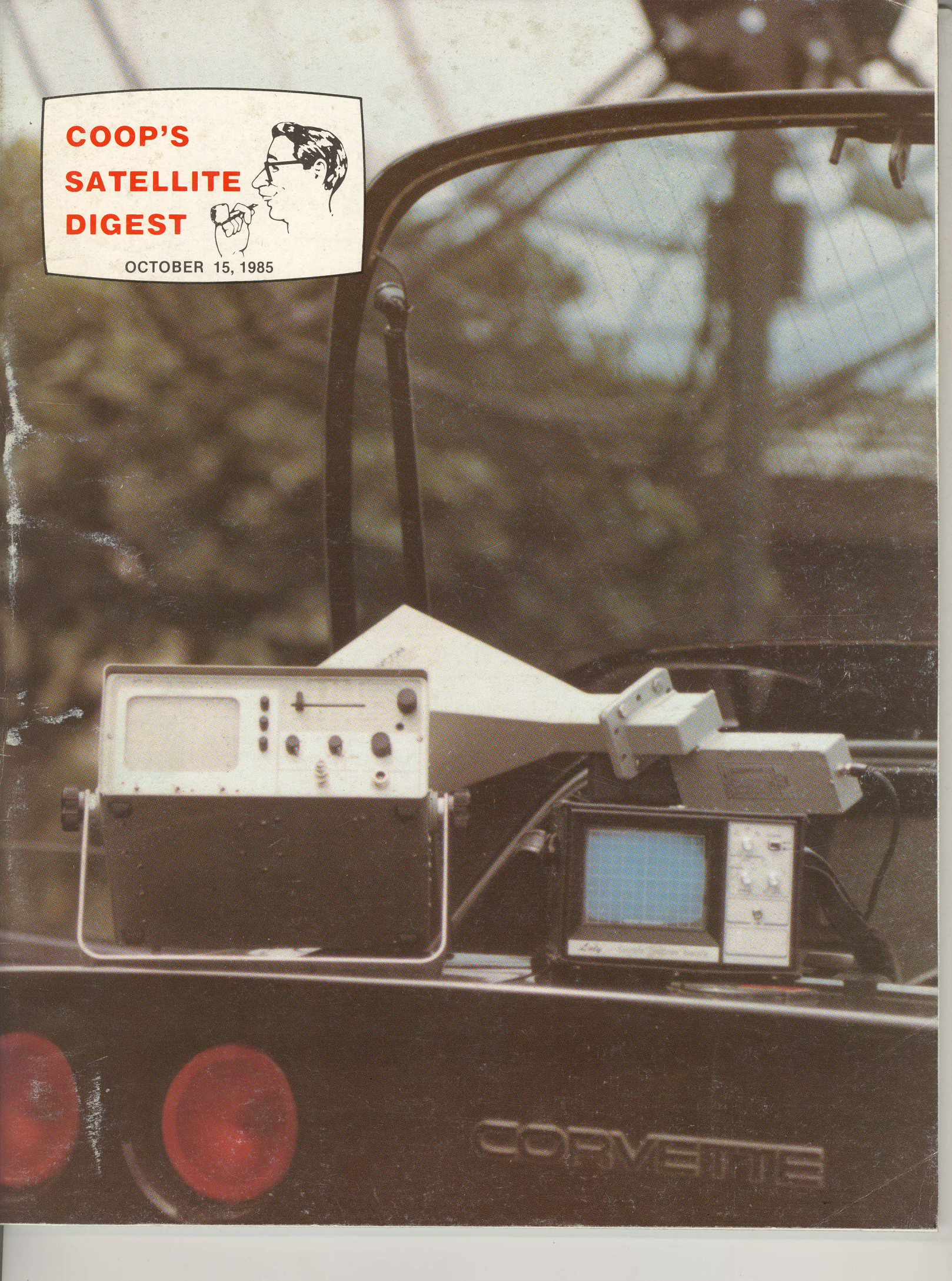


**COOP'S  
SATELLITE  
DIGEST**



OCTOBER 15, 1985





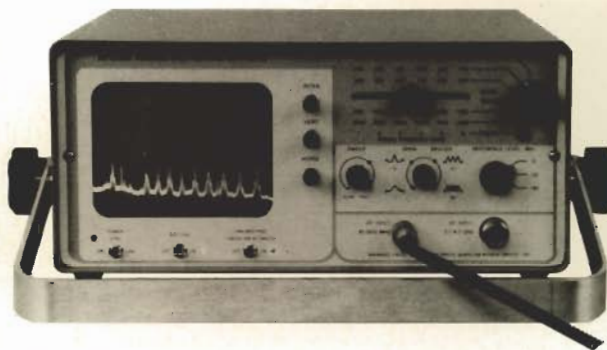
# TAKE ALL THE GUESSWORK OUT OF TVRO INSTALLATIONS AND T.I. ANALYSIS WITH AVCOM'S NEW PSA-35 PORTABLE SPECTRUM ANALYZER

**ASK ANY TVRO DEALER WHO OWNS AN AVCOM PSA-35 PORTABLE SPECTRUM ANALYZER.**

With AVCOM's PSA-35 Portable Spectrum Analyzer you can measure and document TVRO system performance after installation or service. Troubleshoot system problems by observing output signals from LNA's, BDC's, Line Amps and Splitters, and other RF signal components. Measure block system signal balance.

Identify and resolve Terrestrial Interference problems quickly and precisely by displaying offending signals on the PSA-35. Customers can be shown the nature of T.I. problems for clearer understanding.

AVCOM's high performance PSA-35 Spectrum Analyzer becomes even more attractive when price is



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can be identified and corrected in minutes, saving money and time, and reinforcing customers' confidence and trust. In terms of time saved and customer good will, an AVCOM Spectrum Analyzer will pay for itself quickly.

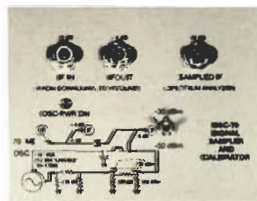
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**TISH-40 TERRESTRIAL INTERFERENCE SURVEY HORN —** AVCOM's new Terrestrial Interference Survey Horn, TISH-40, is designed to be used in conjunction with the PSA-35 Portable Spectrum Analyzer for site surveys.

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# OCTOBER 1985



# SATELLITE DIGEST

CSD is published monthly by Triple D Publishing, Inc.

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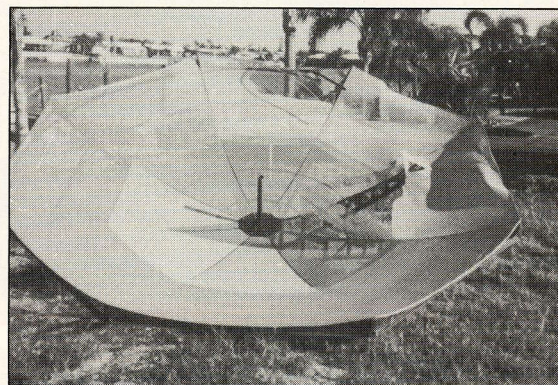
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COOP'S SATELLITE DIGEST published on the 15th of each month by Triple D Publishing, Incorporated (P.O. Box 2384, Shelby, NC 28151-2384; 704/482-9673). All advertising and subscription requests should be directed to Triple D Publishing. CSD has been issued monthly since October of 1979, with Bob Cooper, Jr. as Editor In Chief. Coop 'launched' the home TVRO industry by building the first FCC licensed home TVRO in 1976. This is the 99th edition of CSD. Subscription rates are \$60 per year where US zip-codes apply, \$65 (US funds) for Canada and Mexico, and \$75 (US funds) elsewhere. All non-US copies are sent AIR-mail, worldwide. COOP'S SATELLITE DIGEST is protected by US and foreign copyrights and any reproduction without the expressed permission of Triple D is prohibited. Second class postage paid at Shelby, NC, and additional offices. Application to mail at second class postage rates is pending at Shelby, NC, and at additional offices. **NOTE:** Letters to CSD, technical articles, and new product announcements should be mailed to Coop at West Indies Video, P.O. Box 100858, Ft. Lauderdale, FL, 33310 (305/771-0505).

**OUR COVER**/Test equipment for TVRO moves into the 'fast lane' as leading test equipment suppliers bring out exciting new gear designed to simplify installations and improve trouble shooting. On left, **AVCOM PSA-35** analyzer and on right, **Luly Tele-Communications PSA-12A**. A look at the latest in testing aids starts in this issue.





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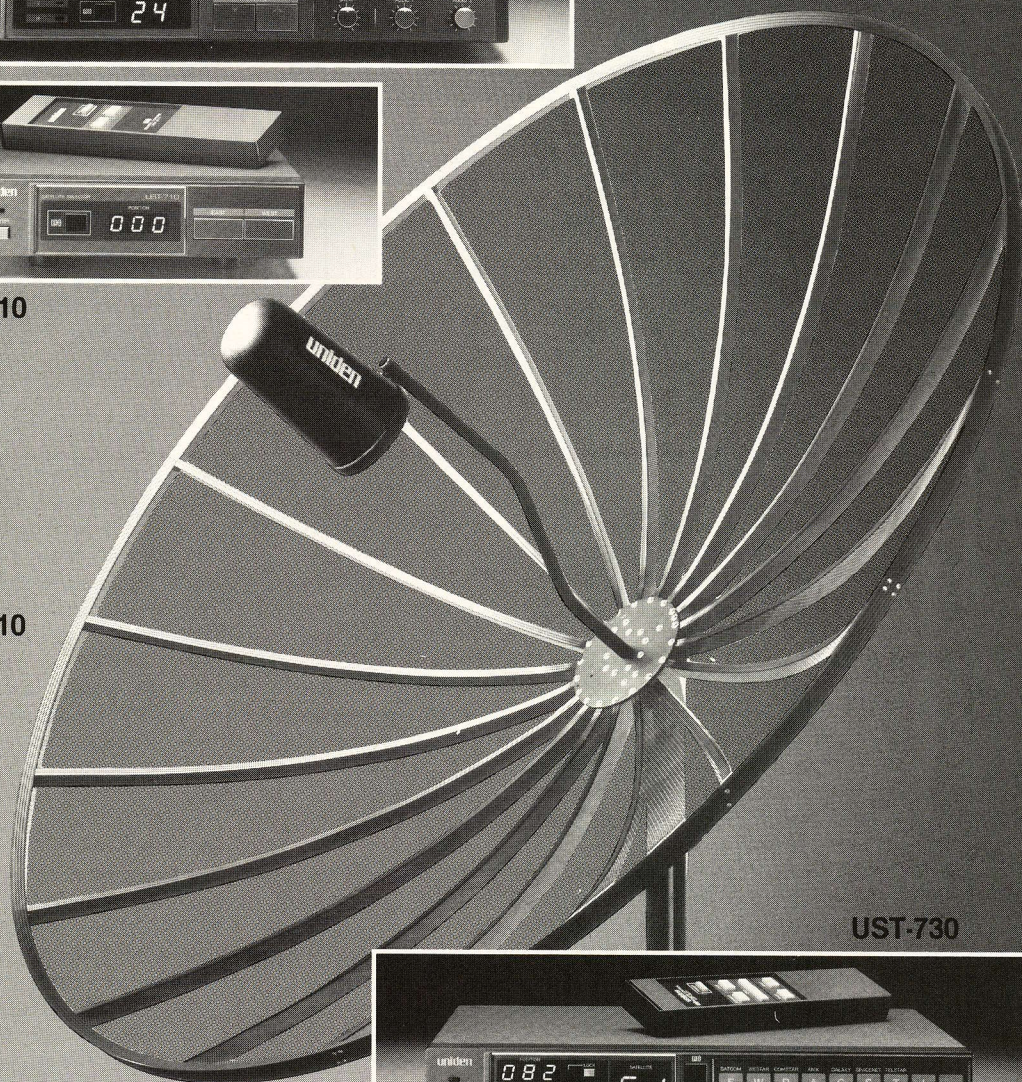


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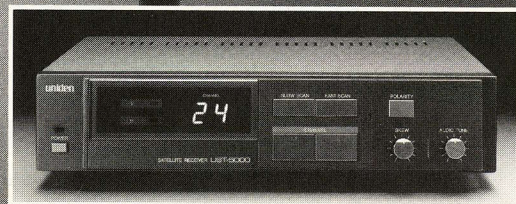
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## COOP'S SATELLITE COMMENT

- **MAKING A BUCK IN Scrambling Confusion**
- **'FM AMERICA' Dangerous???**
- **BEWARE OF Advertising Contracts**

### MAKING Money

Every new business problem creates an opportunity for new business success. A company selling 'blocks of ice,' for example, to restaurants and bars in the 40s/50s and 60s found itself at a competitive disadvantage when a competitor created a machine which produced **cubes** of ice. The bars and restaurants were far better off purchasing cubes than 50 pound blocks and the ice-block company soon found its fortunes waning. Its response was to create a **machine** which could be placed **inside** the restaurants and bars which made tons of ice **cubes** per day. In just a matter of years the ice company producing blocks of ice closed down the ice plant and it became a 'leasing company' which installed on-premise ice cube making machines. The guy in the middle, the 'interim technology' that made cubes of ice in **his own** ice plant, faltered and failed.

**Cable is an 'interim technology' in many ways.** Multiple channels of TV delivered into the home via coaxial cable is certainly better than a handful of channels delivered from terrestrial transmitters. But a **small dish in the home directly connecting the home to hundreds or ultimately thousands of channels** is a far better ('ultimate') technology. Some of the brighter cable operators realize this and just as the ice-block plant operator realized he had to bypass the delivery system to compete with the fellow selling bags of ice cubes, the cable operator is slowly awakening to the reality of direct-to-home delivery. Selling ice cubes in a bag is very similar to delivering channels on cable.

An editorial in a cable trade publication for September is headlined 'Making More Money.' The editorial notes "**Cable must develop new sources (of revenue) to expand.**" Then the editorial, which is followed by a three article series detailing the sale, installation, and maintenance of home TVROs, states:

**"Cable operators can profit from this (home TVRO) market through sales, installation and service of backyard dishes to people they cannot serve with cable. We believe that cable operators are better suited to serve the backyard dish market than anyone else. Who has had more experience in providing television reception and programming than cable operators?"**

Of course, the very concept that cable operators should become a part of the TVRO marketplace is abhorrent to many cable TV firms. The cable publication acknowledges this with "We'll be the first to admit that asking a cable operator to sell home dishes is like asking him to shake hands with the devil." But that does not stop the publication from their bottom line recommendation, which is "If you cannot beat them join them. **Cable can profit from this market** through sales, installation, and service of backyard dishes...."

With limited exception, to date the primary battlefield between cable and TVRO (dealers) has been in the **programming** arena. Cable, as we have reported for several months now, wants to control the programming. They have no plans to allow TVRO dealers to be a part of the **programming-marketing** system. But now we see a new interest, not just on the part of a single publication but on the part of cable overall, to 'sell, install, and service backyard dishes.' And here

we have a cable publication reminding cable operators that they are better suited to serve the backyard dish market than anyone else." Those are pretty strong words of encouragement.

**Now**, suppose you picked up one of **your own** trade publications and you read those words? Suppose you picked up say **Satellite Dealer** and you read an editorial urging cable operators to get involved in TVRO sales, because "cable operators are better suited to serve the backyard dish market than anyone else?" As a TVRO dealer, you would feel betrayed; you would be incensed that one of your own trade publications was actively promoting your own demise by urging your arch enemies to get more involved in your area of business.

The editorial we are quoting from does not appear in **Satellite Dealer**; it appears in **SATguide**. And **SATguide** is a publication designed for cable operators while **Satellite Dealer** is, of course, a publication designed for TVRO dealers.

**Satellite Dealer** and **SATguide** are, however, **both published by the same company** (CommTek Publishing Company). And while the September issue of **Satellite Dealer** is telling readers on its editorial page "**Cable TV operators are campaigning to take the home satellite industry away from dealers like you**" (page 8) and "The Cable TV industry's plan to monopolize the home satellite TV business is simple" and "We think it is time to fight back...", **SATguide** is telling its readers "**SATguide presents a special report on how you (the cable TV operator) can make the most of the opportunities in the home TVRO market.**"

You see, there is so much potential money to be made from the scrambling battles, that even publishers who wear two or more hats are unable to resist the temptation to talk out of both sides of their type-writers at the same time in the same month in two separate publications. And lest **Satellite Dealer** and **SATguide** plead ignorance of what their respective 'staffs' were doing in twin issues both dated September, be advised that both publications 'share' **the same** President and Publisher both share **the same** Editorial Director (Frank Finn), both share **the same** Executive Editor (Bruce Kinnaird), both share **the same** Copy Editor (Dana Yensen) and most damning of all, both share **the same** Editorial 'Coordinator/Administrator' (Shiela Ison). In other words, when **Satellite Dealer** is telling TVRO dealers to fight back, **SATguide** is telling cable TV operators "If you can't beat 'em, join 'em" (1).

It is a strange commentary on our times and the present plight of our industry that dollars and dollars alone guide so many decisions. Alas, the examples go on....

### **FM America 'Dangerous'?**

Utah is not best known for innovation. For some reason, people seldom get inspirations in Utah which change the course of world history. Perhaps all of that beautiful scenery and those majestic mountain peaks are so relaxing to the mind that people forget to be angry. Anger,



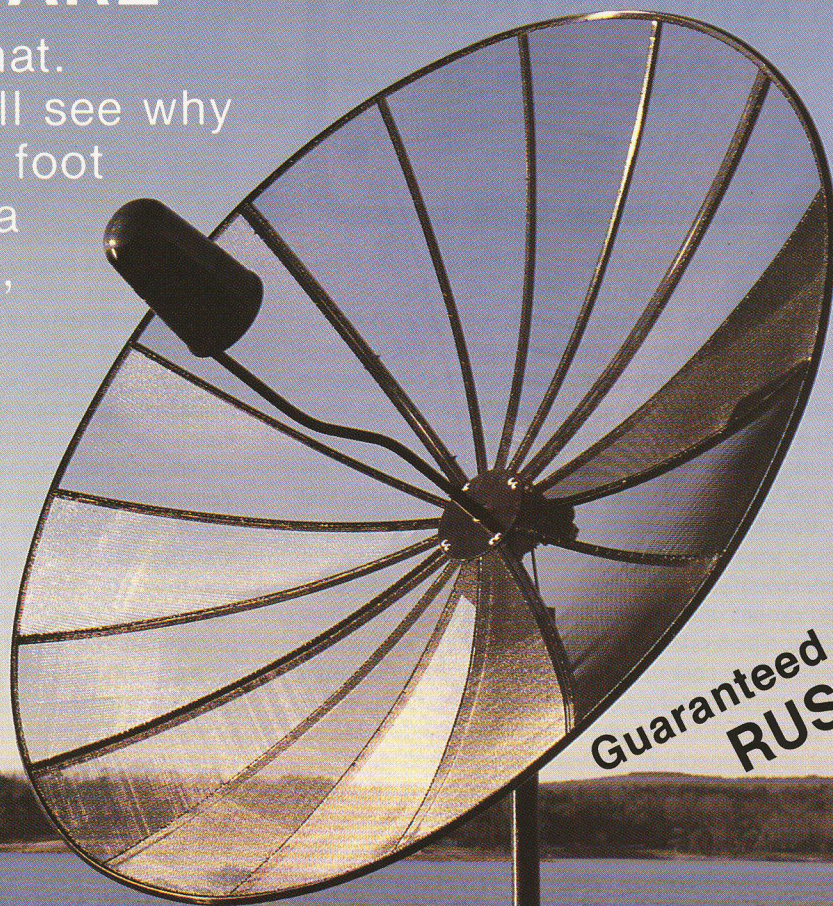
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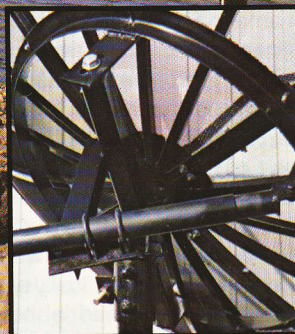


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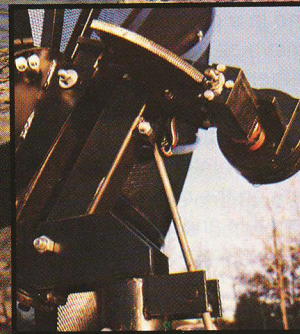
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## 'ANALYZE' YOUR TVRO INSTALL PROBLEMS

### A 'DREAM'

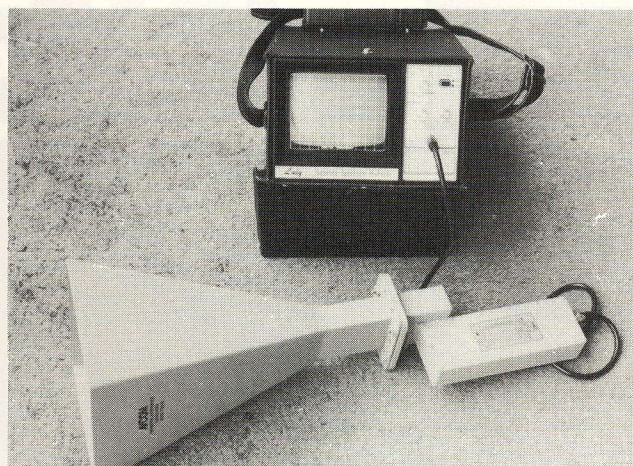
Immediately after 'mastering' the use of the elementary VOM (volt-ohmmeter) the typical technician in any communications service field begins to dream of owning or having use of a 'spectrum analyzer.' Chances are the new tech does not yet understand what an analyzer does (or does not do), or even 'why' he wants one. He simply knows that 'the analyzer' is reputed to be the 'ultimate' test instrument in the field, and as fast car lovers dream of Corvettes, technicians dream of analyzers.

Until very recently, this spring to be precise, a TVRO technician could dream of analyzers all he wished but he knew they were far too high priced for his work or aptitude. That was because 'analyzers' cost upwards of \$5,000 and while they seemed to be very perfect types of test instruments, the fact that some cost \$20,000 and yet others cost \$60,000 had to suggest that not all spectrum analyzers are created 'equal.'

**A spectrum analyzer is a visual test instrument.** So is the TV set. But the analyzer differs from the TV set because while a good quality, even 'calibrated' TV receiver or video monitor can display the 'sum' of all of the TV picture (and sound) parts (i.e. the composite or complete picture), the analyzer has the ability to display any selected **portion** of the incoming (RF/IF) TV signal; such as just the audio or just the video or just the color, and so on.

The analyzer also has the ability to display not just a single TV signal, as does a monitor or receiver, but the 'sum' of all of the signals coming down a cable or from a satellite. This function has become increasingly important as block downconversion or BDC type receivers have gained in marketplace use; where a single channel (transponder) used to travel **alone** in a place of cable between antenna and indoors, now we have as many as 12 channels (transponders) all traveling together. And it turns out that many of our problems relate to just some (or one) of these channels and the best way to determine the nature and solution to such a problem is to be able to see the 'relationship' between each of the signals and the others on the cable or coming from the satellite. The analyzer allows this and much more.

In this report and continuing in next month's CSD, we will be looking first at the analyzer as a tool and then specifically at a pair of new TVRO analyzers which have appeared in the marketplace. We believe when we are done here, you will be



LULY PSA-12A PACKAGE/included analyzer (rear) and carrying case. LNB unit (front, right) expands 'frequency range' to 3.7/4.2 GHz. TISH-40 'horn' by AVCOM.

ready to place your own order for 'an analyzer' since there is no substitute for their versatility, and yes, ease of operation.

### Inside

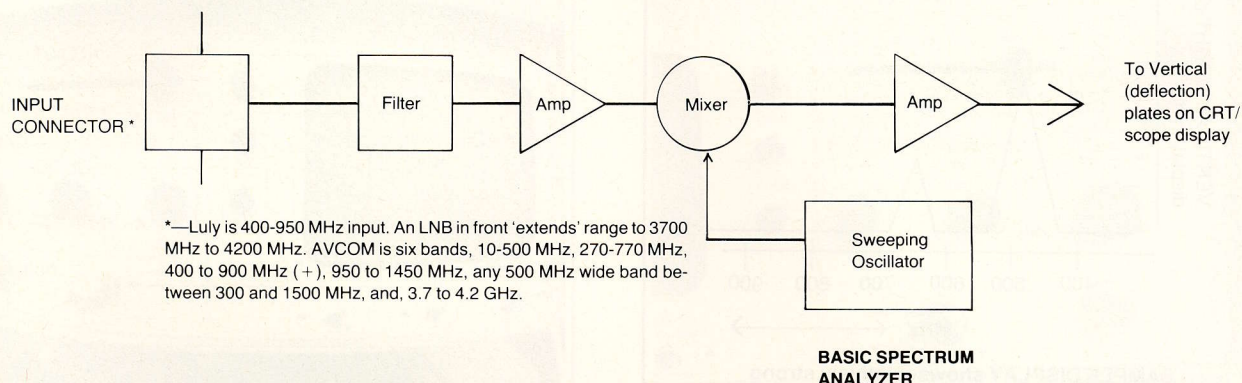
You will probably never take the cover from an analyzer. You might do this just to 'see' what is inside but because of the super sophisticated test equipment normally required to 'trace,' 'isolate,' and 'repair' problems associated with analyzers, they are best left to factory authorized service centers. Still, knowing the basic 'why-they-work' background on an analyzer will be useful to you.

**An analyzer is a receiver;** it has a specified input frequency range and it may have a 'tuning range' within that input range. It has a control that allows you to tune a very wide range ('wide span') or a very narrow range ('narrow span') and the span-width you select with the controls in turn determine the 'width' of your display on the CRT. Wide here means that you 'see' a relatively significant chunk of frequency spectrum on the screen while narrow means that the available CRT display space is consumed by only a small(er) chunk of the available spectrum. Think of the 'span control' as a 'zoom device'; it allows you to 'zoom in' on a tiny chunk of spectrum (such as a single TV carrier or even a part of that carrier) or 'zoom out' on a big chunk of spectrum (such as the full 500 MHz wide TVRO band). Naturally as with any 'zoom' system, the more you see at an instant, the less detail you have of any particular **piece** of that picture.

The analyzer design consists of an input filter which insures that only signals within the designed-for-band (or frequency range selected) gets through the input connector and to the electronic processing circuits inside. The IF in your TVRO receiver also has filtering, to separate the one (or group of) desired channels from all of the rest of the electromagnetic spectrum out there.

After the filter is some sort of amplifier, designed to boost the signal level of the (filter) chosen frequency segment. The amplified signal is then directed to a 'mixer' where it is mated with a device called a 'sweeping oscillator.' This oscillator, unlike the oscillator you find in a TVRO receiver, moves-in-frequency at a specified rate and over a specified frequency





range. Your controls can change the 'rate' which the sweeping oscillator moves at and the frequency width the oscillator covers, with many analyzers.

The output of the mixer now contains each of the carriers within the chosen frequency band and this new signal range is amplified and then detected. However, rather than taking the individual carriers to a video (or audio) amplifier, the signals are processed into a circuit which connects the output to the vertical (up and down) 'deflection plates' on a CRT (cathode ray tube).

The strength of the individual carrier (signals) intercepted by the sweeping oscillator determines just how much up and down height or display is produced on the CRT. **Strong signals go higher** on the CRT (tube) face than weaker signals. By adjusting the analyzer span controls, the bottom line be-

comes frequency or 'time.' Typically, lower frequency signals (such as 500 MHz) show up on the left hand side of the CRT display while higher frequency signals (such as 510 MHz) show up to the right. Thus the display, when studied, tells us two things instantly:

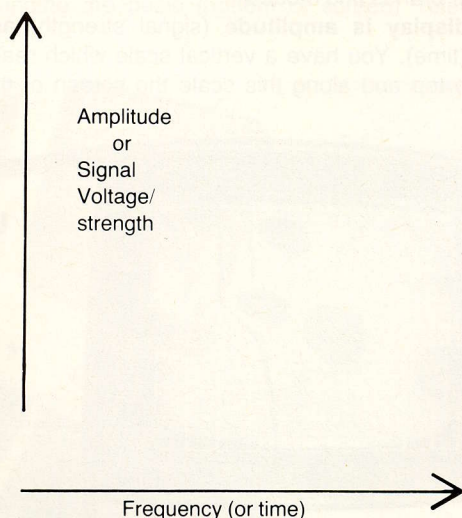
- 1) How **strong** the signals are (the screen is calibrated), and
- 2) How much **frequency space** the signals occupy, and with some calibration help, even the frequency of the signals.

There are changing measurement requirements, so the user would like to be able to alternately 'see' all of the spectrum of interest (such as 430-930 MHz or a block band output from a LNB or downconverter), or, see just a small portion of this spectrum. That's where the 'span' or 'width' control comes in. **We see two examples** of that here in **diagram form**.

Close ('zoomed-in') analysis of a portion of a spectrum brings the user the opportunity to determine special characteristics of that individual signal. An 'AM' or terrestrial TV signal, for example, may have some form of interference in it. You can 'see' the effect of the interference on the TV screen, but you cannot deduce from the interference-laden picture the exact **cause** of the interference.

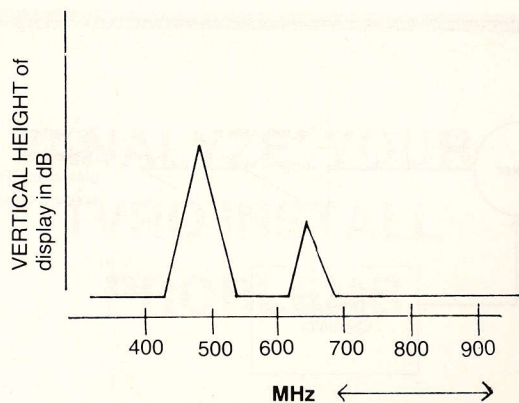
"If I could just take the picture apart, and see that interference all by itself" you muse "then I could try to eliminate the interference." The same approach follows with terrestrial interference (TI) that impacts on TVRO satellite signals; **you know you have TI**, but is that TI on 'one side' of the signal, or both sides? Will a 60 MHz 'trap' help? How much trapping do you need to knock down the TI signal? You can answer all of these questions and several more unasked in seconds with an analyzer display.

The spectrum analyzer device has been with us since (before) World War Two. The military first used these gadgets, in a very elementary form, to search for signals from German and Japanese communication systems. Since military communications could 'frequency hop' about the spectrum with ease, and seldom lasted more than a minute, the chances that you would have a regular receiver tuned to the correct frequency when the 'enemy' decided to transmit was small. A system to 'look' at the 'spectrum,' to watch for signals was needed. When a signal was spotted (a blip on the screen), then a standard receiver could be quickly dialed to the indi-



**BASIC SPECTRUM ANALYZER produces two separate 'CRT displays'; signal level (bottom to top of screen) and signal frequency (left to right with lowest frequency at left).**





**SAMPLE DISPLAY** shows relatively strong signal at approximately 525 MHz, weaker signal at approximately 630 MHz.

cated frequency and the transmission monitored.

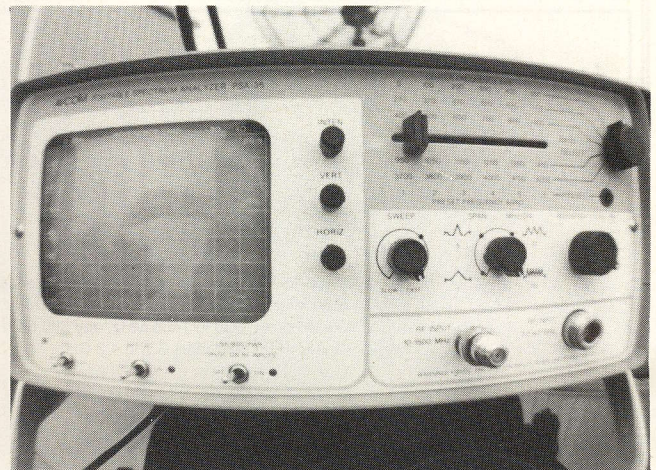
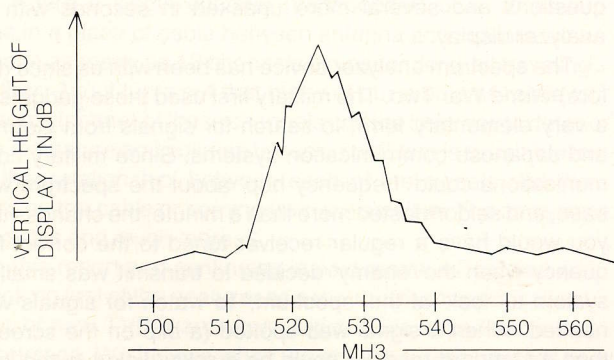
After World War Two, engineers found that the analyzer (its original form was called 'Panoramic Adapter') could do far more than watch for enemy transmissions; it had the ability to 'analyze' entire transmission and reception systems, quickly and accurately.

#### 'OUR' Analyzers

A number of firms, building test equipment for communications, have had spectrum analyzers available for as long as there has been TVRO. The prices were high because the instruments were typically, including our desired 'bands of coverage', only a small part of a much more, complex set of bands covered. The instruments were designed for laboratory or highly critical field work and price tags in the \$20,000 region were (and are) common.

What **Luly Telecommunications**, and **Avcom**, have done is to approach the spectrum analyzer with the same general 'mindset' which early TVRO receiver designers put to work. Namely, we had TVRO receivers **before 1979**; they cost \$7,500 each and were hardly user friendly. Only engineers could operate them and only millionaires could afford them.

**Bob Luly and Andy Hatfield** approached the analyzer problem from a different perspective; create an analyzer specifically for TVRO use, eliminating those frequency bands that do not involve TVRO, and eliminating those nice-but-expensive functions which we seldom (or never) would use anyhow. The result, the Luly **PSA-12A** and the Avcom **PSA-35** analyzers are designed by TVRO engineers for use by TVRO techni-



**AVCOM PSA-35** is ready to 'swallow up' nagging service problems.

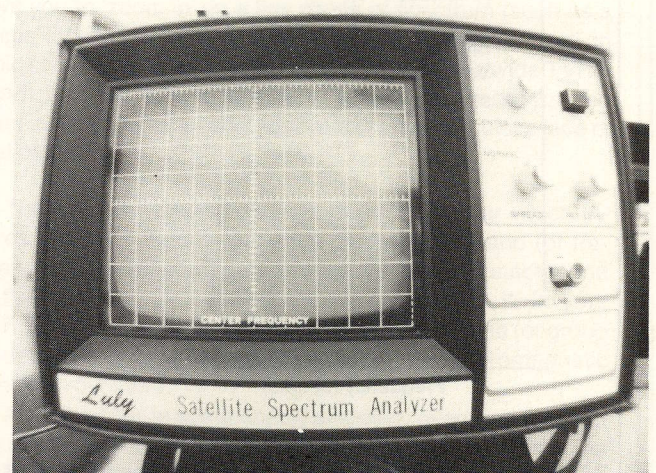
cians (and engineers). You don't need a PHD to operate one and you don't need the NBC test budget to buy one.

Of the two, Bob Luly has gone 'further' to tailor the use of the unit to TVRO than has Andy Hatfield. The AVCOM unit is more sophisticated and more expensive. The AVCOM unit will also do quite a bit more, in the field, than the Luly but that is not to 'slight' the Luly since for your application you may never need to do more than it is capable of doing. The price differential between the two is almost precisely 2X; the Luly costing about half of what the AVCOM costs. We'll see why, and compare the two in common TVRO user applications in part two of this report (November 15th CSD).

#### DISPLAY

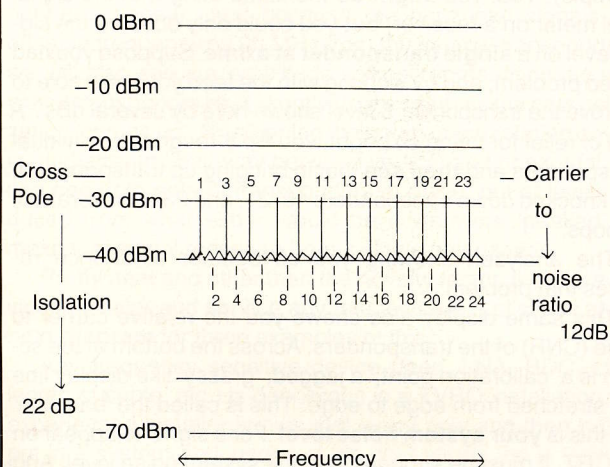
The CRT is your 'meter face'. It will take you from a few minutes to a few hours to learn (once learned, not forgotten) how to 'interpret' this unusual 'meter face.' We'll try to help since there are general characteristics with all analyzers which cross over brands and models.

**The display is amplitude** (signal strength) and **frequency** (time). You have a vertical scale which reads from bottom to top and along this scale the screen of the CRT



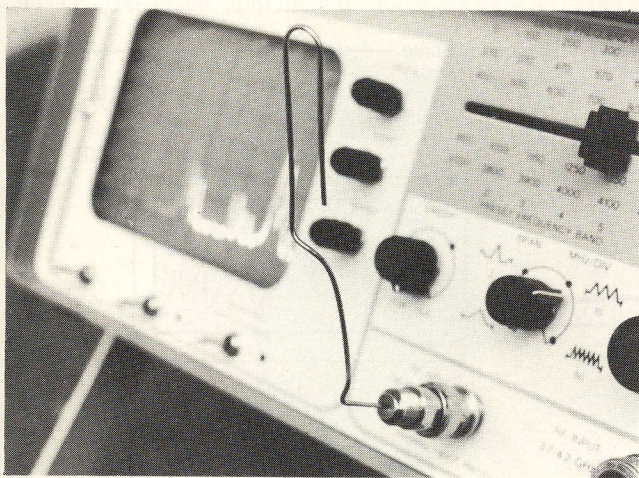
**LULY PSA-12A** is designed for portable use with receivers operating with IFs in 430/930 MHz (+) region; LNB makes it useable in C band region as well.



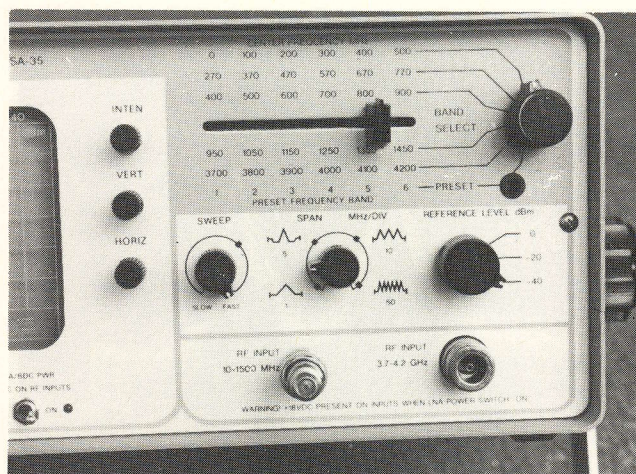


**IDEALIZED DISPLAY** shows presence of 12 (vertical on F3R) transponders. Dashed lines indicate where, from 'baseline noise,' opposite polarity signals would 'pop' out of noise if polarization was rotated. FM carrier to noise ratio is illustrated on right; noise at -50 dBm, and peak signals (5,9,19) at -36 dBm results in (peak) CNR of 14 dB ( $50 - 36 = 14$ ).

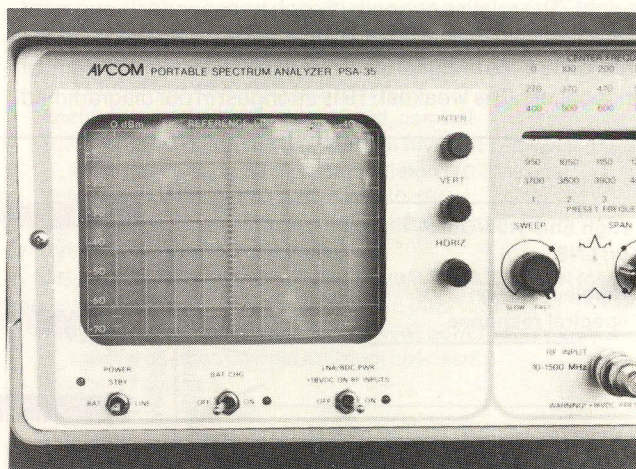
faceplate cover has 'calibration' marks in place. This plastic cover has lines silk screened or etched on the surface and you view the actual CRT display 'through' these calibration lines. The vertical scale is in dBs or units of dBs. The closer you get to the top calibration lines, the stronger the signal. A very strong signal would push to the very top of the screen, seemingly 'off the screen' at the top. There are user 'sensitivity' controls which allow you to return the full display to the CRT face by changing the basic (bottom of screen) 'reference/floor level.'



**OLD PAPER CLIP TRICK/** virtually everyone who unpacks a new spectrum analyzer reaches for a paper clip to insert into the 'signal-in' connector. This small antenna provides 'reception' in the chosen frequency band as we see in the background here with the AVCOM PSA-35 analyzer.



**AVCOM PSA-35 CONTROLS** provide the user with independent control over the input frequency range (top switch and slide control), rate or 'speed' of the sweep (left/center), width (frequency) of display (next right), input 'reference level' (far right, center) and a pair of inputs for connection to cable or antennas (bottom).

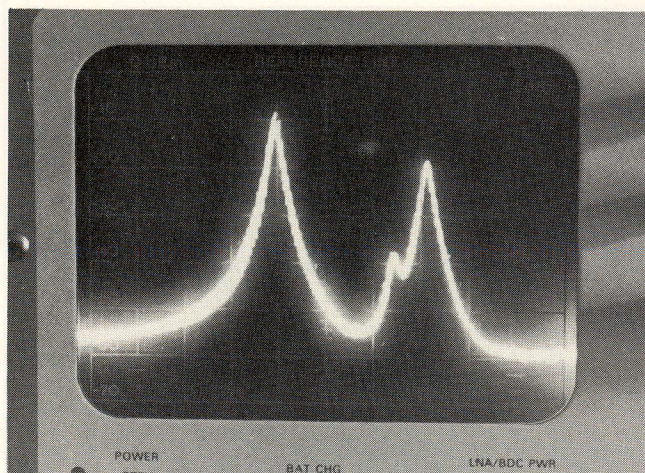


**AVCOM PSA-35 DISPLAY**/black and white 'CRT' (cathode ray tube or picture tube) with special phosphors designed to allow display to 'persist' longer under varying signal conditions and display 'brighter.'

The horizontal scale is frequency, as previously noted. The analyzer gives you control over the full-width display frequency range (by selecting different frequency 'bands' with a control) and then with the 'span' or 'width' control you have control over how much of the 'master band' you want to see displayed. Calibration of frequency is less precise than calibration of amplitude; **the analyzer is not a frequency counter or meter.** It, in most under \$20,000 instruments, relates a 'rough' or 'approximate' frequency and for most applications you encounter in TVRO, this is all you need anyhow.

Plugging into a satellite antenna equipped with an LNA and either watching the direct satellite band (3.7 to 4.2 GHz; with the Avcom PSA-35) or watching the IF (converted) band at block IF (through either the Luly or Avcom unit), you have a display approximately as (idealized) here in **diagram form**. Each of the (FM) transponders in the band is displayed; lowest frequency at the left and highest frequency (transponder) at





**NORMAL 'AM TV'/A standard (terrestrial) TV signal looks like this; video carrier (tallest 'spike', to left) followed by slightly shorter (less powerful) audio carrier at far right. The small 'pip' on the left hand edge of the audio carrier is the color sub-carrier located 3.58 MHz above the visual carrier. (PSA-35)**

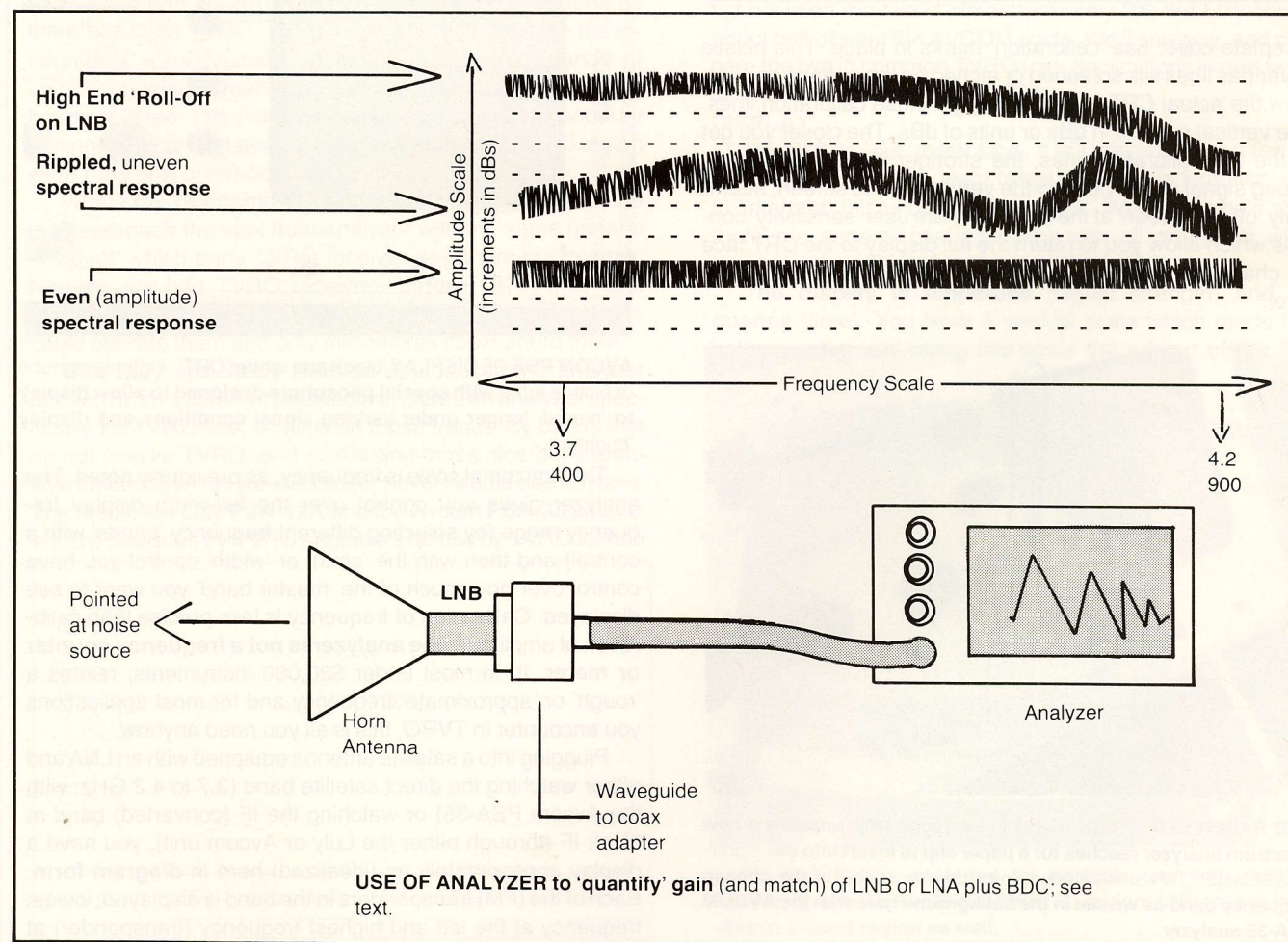
the right. The relative strength of each transponder is apparent on the vertical scale. This display quickly helps you spot the actual difference in signal level through the antenna system, of transponders (3 is weakest, 19 is strongest in our diagrammed

example). **Yes**, you **might do** the same thing with the signal level meter on a receiver, **but** you could only observe the signal level on a **single transponder at a time**. Suppose you had a feed problem, and by working with the feed you were able to improve the transponder 3 level shown here by several dBs? A sigh of relief for being so bright, you flip through the individual transponders and **then see** that in bringing up transponder 3, you knocked down transponders 19, 21, and 23 by several dB! Oooops.

The analyzer, showing you all-together all-at-once resolves that problem.

This same display also shows you the relative carrier to noise (CNR) of the transponders. Across the bottom of the screen is a 'calibration point;' a jagged, 'grassy' like display line that stretched from edge to edge. This is called the 'baseline' and this is **your system noise level**. For a signal to appear on the CRT, it must be stronger than the system noise level. And because the screen is calibrated, you can actually see and measure how many dB stronger the signal is than the noise level. In our diagrammed example here, we see carrier to noise ratios in the 11 to 14 dB region.

Now, by rotating the polarization device, the transponders in our display will change (odd numbers or vertical of F3R is indicated first) and we will actually 'see' the first set of transponders reduce in level and enter into the grass-baseline noise





just as the opposite polarity signals, from the horizontal transponders, appear. And because the horizontal signals are offset in frequency by 20 MHz from the vertical transponders, we will also see the 'amplitude spikes' representing the individual transponder shift slightly (to the right) as the new polarization 'comes up'. By stopping the polarization rotating device in 'mid-stream,' half-way between vertical and horizontal, we can see both sets of transponders in place, but at levels reduced from what either would be if we were 'peaked' for maximum signal reception from a single polarization.

Pretty neat and other than the novelty factor, there are obvious installer and service advantages here. Let's look at the **next diagram** for three examples of this.

Any frequency sensitive device (feed, LNA, BDC, LNB, length of cable, etc.) is dangerous in a TVRO installation. An experienced installer knows that every now and then he will put in a system and in spite of his best efforts, he is losing a single channel or a couple of channels. The 'lost' channels may be at one end of the band (low or high) or they may mysteriously be in mid-band. He knows **something** in the system is frequency sensitive, but what, and by how much?

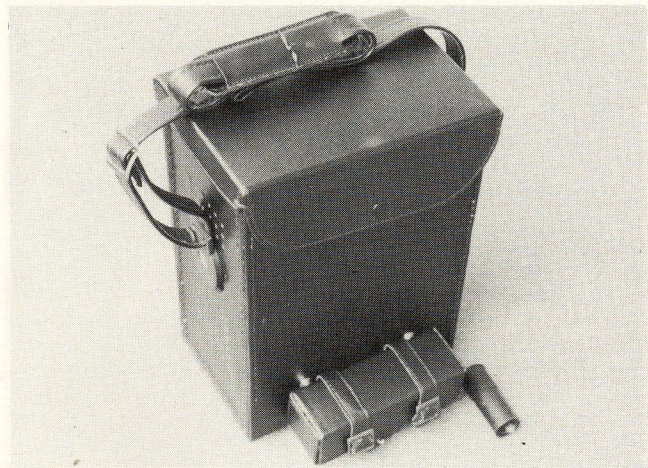
#### Enter The Analyzer

With an analyzer, each part in a system can be tested. There are several ways to do this and we'll look in some detail at them in a subsequent issue. Basically, here is what is required:

1) A totally flat 'signal source' is required. **The sun** is such a flat signal source (remember the 'solar outage' problems when the solar noise output overrides the satellite signals?)

2) The **ground**, earth, can be such a source.

What we need to do it to 'couple' some flat-noise source through the component parts of the system and observe the performance of the system on the CRT of an analyzer. In our diagram here, we see a horn feed antenna connected to an LNB (it could be an LNA, in which case a BDC would have to follow the LNA) and this in turn is connected to our analyzer. The flat noise source provides a uniform signal to the horn which couples the flat-field energy to the amplifier/converter device. The 'noise' from the flat-source appears as grass on



**PACKED AND READY** to go, Luly analyzer comes with own carrying case, snap-on rechargeable (Nicad) battery pack and AC to DC charger for the battery pack.

#### TECHNICAL DETAILS/Luly Telecommunications

##### PSA-12A Analyzer

Frequency Range: **430 to 930 MHz** (expandable to 3.7 to 4.2 GHz with an LNB outputting 430-930, or LNA plus BDC outputting the same range)

**Accuracy:** Vertical scale of  $\pm 3$  dB 'absolute' claimed for amplitude; no claim for horizontal (frequency) accuracy  
Scale: Amplitude is **5 dB per CRT division** (8 divisions) while horizontal display is approximately **50 MHz per division** when controls are properly adjusted

**Reference Level:** From -30 dBm to -40 dBm

Signal Range: Useful displays of amplitude from **-30 dBm to -80 dBm**

**Connectors:** F for input, cigarette lighter plug for external battery or charger

Power Requirements: **12 VDC at 2.5 amps** (useable from 11.5 volts to 15 volts)

**Weight:** 10 pounds

**Price:** \$995 dealer net

**Availability:** Through selected national distributors or through Spectrum 1 Distributors, 3421 E. Tropicana Avenue, Las Vegas, Nevada 89121; (Jon M. Parks).

#### TECHNICAL DETAILS/AVCOM PSA-35 Analyzer

Frequency Range: below **10 MHz to 500 MHz, 270 to 770 MHz, 400 to 900 MHz, 950 to 1450 MHz** and optionally any 500 MHz band between 300 and 1500 MHz, plus, **3700 MHz (3.7 GHz) to 4200 MHz (4.2 GHz)**

**Accuracy:**  $\pm 2$  dB within each band, nominal  
Scale: Amplitude is **10 dB per vertical division** (7 divisions) while frequency is **50 MHz per division** (10 divisions)

**Reference Level:** 0 dBm, -20 dBm, -40 dBm

Signal Range: Useful displays from **0 dBm to -100 dBm**

**Dynamic Range:** Greater than 60 dB

Connectors: **F** for input on all bands but 3.7 to 4.2 GHz, **N** for 3.7/4.2 GHz

**Power Requirements:** Internal 117 VAC power supply and internal charger. Current drain not specified.

**Weight:** 17 pounds

**Price:** \$1965 dealer net

**Availability:** Through AVCOM, 500 Southlake Blvd., Richmond, Va. 23236. 804/794-2500.

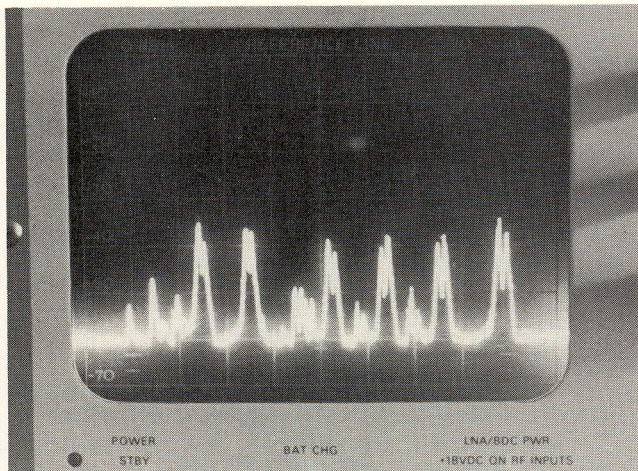
our display. We see three, 'stacked' examples of how this might turn out in our diagram:

1) The display can be **flat**, straight across, in which case (bottom 'grass line') everything in the system is passing the 'flat-source signal' uniformly. The system is a 'go.'

2) The grass line is **waving**, with alternating peaks and valleys. This tells us something in the test system in exhibiting either poor 'impedance match' or there are variations, staggered as it were, in the gain and conversion stages in the system. This effect will result in good looking signals for those transponders that happen to fall at or near the 'peaks' and poorer service from those that happen to fall (in frequency) in the valleys.

3) The grass line is uniform, but it **gradually falls off** on one end; the high frequency end is indicated here. This means that something in the system is 'rolling off' or 'clipping' a part of the TVRO band. It could be in the amplifier gain stages (lack of uniform gain across the full 500 MHz band), it could be in the conversion, downconverter, and so on.





BAND FULL of cable TV signals. Individual carriers, each with a separate video carrier and audio carrier and color sub-carrier, spreads out on the display. To study an individual carrier more closely, you adjust the controls to 'spread' the display out (PSA-35)

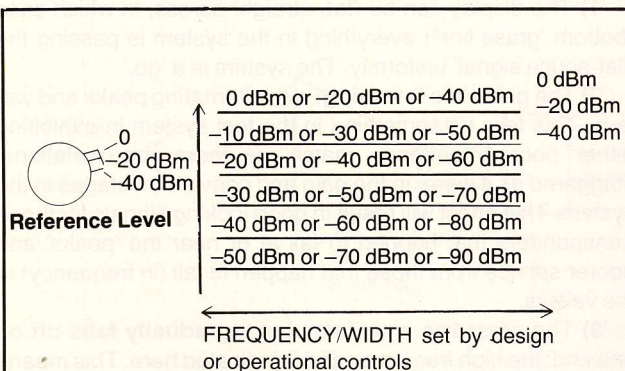
Cables can cause this just as well as pieces of electronics. Polarization rotation feeds can cause this. Once you have a test system rigged up with an analyzer, you can 'grade' or 'troubleshoot' a whole pile of equipment in just minutes. There is no quicker nor more accurate way to troubleshoot or grade equipment pieces as standalone units or as parts of a complete system.

#### Calibration

We have already mentioned that for most analyzers which you will want to consider for TVRO applications, your vertical scale is the most important scale. Amplitude, or a lack of it, and the relative amplitude across a band of frequencies is the most important on-going measurement tool you will expect from your analyzer. We also mentioned that exact frequency, while 'nice', is seldom required and when you do need it, expect to pay around \$20,000 and up for an analyzer which has the built-in ability to determine operating frequency accurately.

Just how do we calibrate an analyzer for 'absolute levels'? A cryptic answer might be 'carefully'.

Amplitude is important from two different points of measurement. There is 'absolute amplitude' and 'relative



CALIBRATION OF AMPLITUDE (vertical scale) establishes absolute signal level readings (+/-2 dB for example) while scale windows adjust sensitivity of display.

amplitude'. Absolute amplitude is much like absolute frequency; if it is important to you to know within a fraction of a dB the absolute carrier level (power) of every signal you see on the display screen, expect two things:

- 1) Big (very big) bucks for the privilege;
- 2) Complex operational controls.

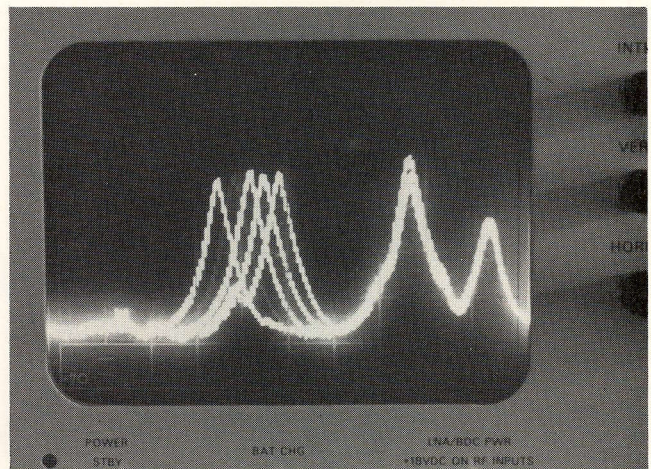
AVCOM takes the view that if the 'absolute accuracy' of the display can be 'read' to within +/-2 dB of some known (reference) level, the user will find that adequate. Luly uses +/-3 dB for their 'accuracy' level reference. In the real world, as we shall see next month, neither of these numbers may be all that important and whether either 'machine' reaches their stated goal may be a moot point.

Absolute accuracy, built into an analyzer because it has some sort of internal 'standard level reference system', is useful when you are measuring real world power levels; i.e. you need to know the real, and exact, power level of a carrier. **We virtually never need to know this in TVRO.** But we do need to know the **relative difference** between two (or more) separate carriers.

'Relative levels' are a snap with either machine since we have a display screen that is calibrated and a system that allows us to visually read the relative levels between any two or more carriers within the frequency band chosen. The screen, calibrated, tells us the carrier 'A' and carrier 'D' are 3 dB apart in signal level. That helps us determine not only 'fixes' but whether something really needs to be fixed at all.

AVCOM provides three separate 'amplitude scales' on the PSA-35. In our **final diagram** for the month we see how this works. The 'reference level' of the top of the screen changes as you select a 'range' with the three position knob. Either the topline reference is -40 dBm, -20 dBm, or 0 dBm. This is a form of 'sensitivity' control as well since very weak signals will register on the -40 position while very strong signals might be driven 'clear off scale', above the top of the CRT display, unless you were dialed into the 0 dBm region.

The Luly unit has a continuous sensitivity control which is factory adjusted to operate in the -30 to -40 dBm region. With calibration 'tick marks' at opposite ends of the continuously ro-



DITHERED/THIS CABLE TV scrambled signal consists of a rapidly varied (in frequency) carrier (center of screen; quadruplicate trace) stuck into the regular TV 'passband' with the video carrier on right. (PSA-35)



tated knob, the full scale signal levels are either -30 dBm or -40 dBm. We'll see what all of this has to do with typical TVRO use next month.

Both the Luly and Avcom units contain internally adjusted calibration reference points so that the user when selecting a display sensitivity choice opts for some known amount of maximum (and minimum) signal.

Between maximum scale sensitivity and the bottom of the screen we have some number of dB of 'display range'. In the diagram here, **essentially** the PSA-35 faceplate, we see that the range from top to bottom (or bottom to top) is 60 dB. The Luly unit provides a 40 dB vertical scale 'window'.

Next month we will continue this series on analyzer use by putting the two units into the field to see how they perform.

## BLOCK TESTING ON AN INSTALLER BUDGET

One of the more frequent problems encountered by dealers installing their first block downconverted satellite cable systems is the lack of test equipment and test procedures. In this report, methods of BDC system testing will be described that can be performed with a block receiver, a television set, and less than \$200 in test equipment. A basic BDC headend is illustrated that can be constructed by dealers to test BDC products. The problems illustrated by sweeper response and spectrum analyzer photographs may be duplicated by the dealer and identified using a "calibrated" receiver and simple A/B performance comparisons.

**Before starting** with the test procedures, three new products from California Amplifier are tested. An 85 degree California Amplifier (**Model CS420958-A**) dielectrically stabilized LNB was used by the author in tests involving actual satellite signals. You can see, from **figure 2**, the equal (+ or -2dB) amplitude of each satellite transponder. When amplifying a block of satellite signals it is important that the block be as flat

**Dealers** faced with installing BDC type home systems must somehow cope with a shortage of low-cost test equipment which functions within the BDC frequency range. While owning an 'analyzer' is nice (see page 8 here), the neophyte installer may not have \$900 or \$2,000 for his test equipment budget. **Engineer Lantz** presents an alternative method of determining the relative performance of BDC units, and in the process of equipping your own shop for this sort of qualitative measurement, you will develop a new appreciation for the hardware you use daily.

by  
**David L. Lantz**  
**Network Communication Services**  
16134 128th Ave. S.E.  
Renton, WA 98055  
(206/271-5636)



as possible (see part one). The actual amplitude of each block converted transponder was measured to be -32 dBm or +17 dBmV after 100 feet of RG-6. That is a healthy amount of signal for splitting to multiple receivers.

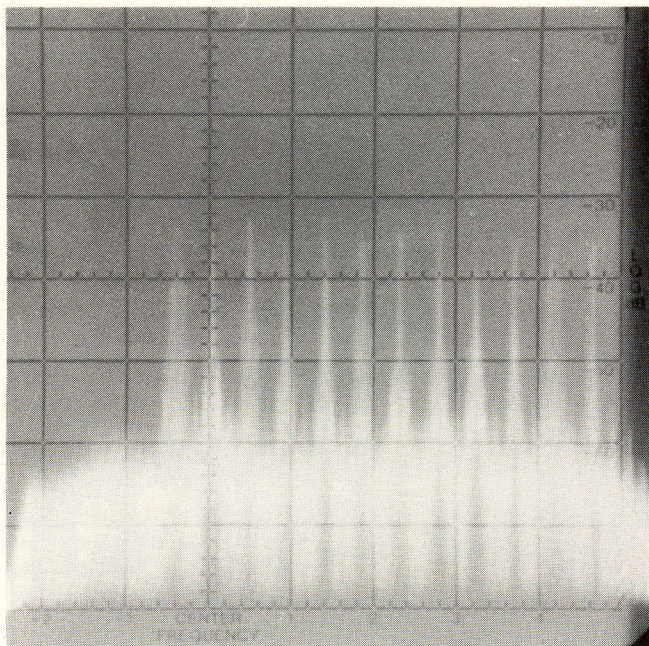
**Of equal importance** is the lack of image noise in the block converted **passband**. In the first of the series of BDC Distribution articles, test results of a Locom LNB were displayed. A bad batch of units from Locom were received recently by TX Engineering. Images of the blockconverted signals appear "mixed" with the actual signals, as you can see from comparing the Locom signal in **figure 4** with that of the California Amplifier signal in **figure 3**. Hopefully Locom has identified and corrected the problem.

The California Amplifier "Lossless Dual Polarization 2-Way HV Switch" is an **amplified electronic A/B switch** that operates from 50 MHz to 950 MHz. A single Model CS09HV5D unit was sweep tested and found to be truly lossless. The overall passband flatness variation from 50 MHz to 930 MHz was found to be within 1 dB. The trunk to receiver port isolation was measured to be an excellent 44dB. Although I did not use the Cal Amp H/V switch in the present article on BDC testing, I foresee many applications for the device beyond basic multiple receiver connections.

A second device from California Amplifier used in this article was an 18 dB line amplifier. Two units were tested and each displayed identical gain versus frequency results, as seen in **figure 6**. I found the units preferable to any low power line amplifiers tested so far. The built in tilt compensation of 3

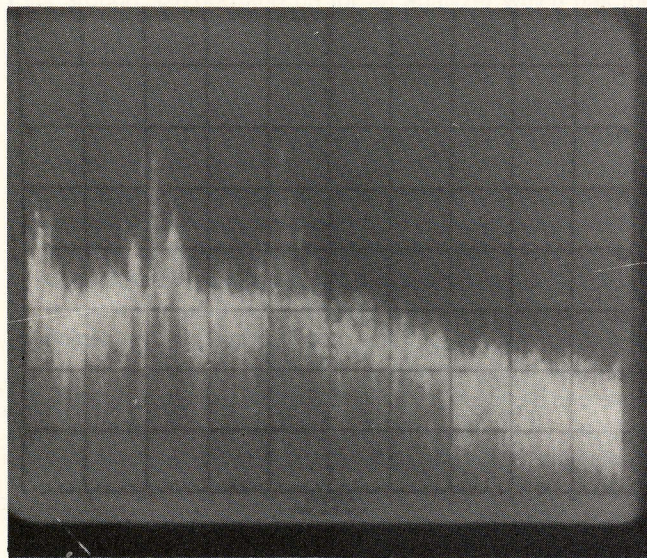
**Editor's Note:** If the terminology here is not familiar to you, see CSD for May 01 ('SMATV CTN System Engineering'), August 01 ('BDC Distribution') and September 01 ('Wireless BDC Distribution').



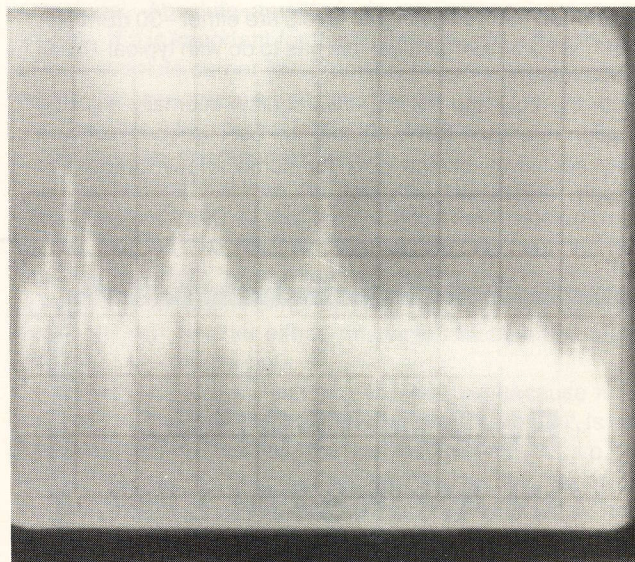


**FIGURE 2**  
Spectrum Response of Cal-Amp LNB on Galaxy 1

dB across the satellite band is adequate for most situations. The Model C07952 line amplifier reaches its 1 dB compression point with an input of 32 dBmV. Network Communication Services recommends that amplifiers used for FM Video signals be operated **18 dB below** the 1 dB compression point. Based on that, the maximum input level to the line amplifier should not exceed 14 dBmV. In other words, when using a California Amplifier LNB, **allow at least 10 dB of cable and passive loss** after the LNB **before amplification** with a Model C07952 line amplifier. When using the line amplifier for



**FIGURE 3**  
Spectrum Response of Cal-Amp LNB (430-930 MHz) on Comstar D4 bird; note lack of 'image' or unwanted signals above highest channels (only LNB noise is seen).



**FIGURE 4**  
LOCOM LNB Spectral Response (notice patterned image noise above the upper-most transponder).



**FIGURE 5**  
California Amplifier H/V Switch Model CS09HV5D (see report in this issue by dealer Greg Heifner as well).



both VHF signals and blockconverted satellite signals monitor the VHF signal level closely. The VHF signals can also overdrive the amp.

#### QUALITATIVE vs QUANTITATIVE Evaluation

The common type of measurement used by TVRO installers is to observe the picture from the receiver while making system adjustments. This type of measurement is considered **qualitative** since a judgement in the relative quality of the picture is required.

A second type of qualitative test that is familiar to all dealers is that of the A/B comparison. If a specific component, such as an LNA, is suspected of being faulty, a second component is substituted for the suspect unit. A single change is made to the reception hardware while observing the picture quality.

Satellite receiver signal strength meters may also be used for qualitative signal measurements. Meter readings are qualitative since home satellite receiver meters are referenced to some arbitrary IF gain adjustment. The receiver meters can be used to compare **the strength** of one channel versus another, but **without calibration** are not useful in providing the **actual amplitude** of the signals. Later in the article a method of calibration will be discussed to turn selected block receivers into useful pieces of test equipment.

To accurately measure the true signal peak(s), a **quantitative meter** such as a Spectrum Analyzer is required. The peak signal level of each individual blockconverted satellite transponder is measured relative to a signal level of 1 millivolt. One millivolt of peak signal equates to **0 dBmV**.

The "Tweakers" and "Squawkers" presently on the TVRO test equipment market provide a qualitative measurement of the summation of ALL the transponders within the block. These devices are worthwhile in peaking an antenna but do not provide sufficient information to be used in balancing a block distribution system.

Two methods of signal measurement shall be illustrated in the alignment and troubleshooting of BDC distribution systems. **The preferred method** involves the use of a Spectrum Analyzer and a Scalar Analyzer while the second (**low cost**) method requires a calibrated step attenuator, a 'metered' block satellite receiver and a video display.

**Experience is the most valuable tool** available to the dealer. The knowledge gained by controlled experimentation with a block system in the dealership allows the installer to identify specific problems by symptoms. Typical system problems, such as improperly installed connectors, over driven amplifiers, and weak signals due to excessive cable loss, should be duplicated in the shop under controlled conditions.

#### The FM Audio/Video Signal

**Figure 7** illustrates a spectrum analyzer display of the **block** of signals that must be distributed to each of the satellite receivers in the block system. A **single FM video color bar** signal is illustrated in **figure 8**. Notice the **wide bandwidth** required on the FM signal **as compared to** the local VHF amplitude modulated TV signals (channels 7, 9, 11, and 13) shown in **figure 9**. The bandwidth differences between the two signal types prevent the use of existing field strength meters to measure FM TV signals.

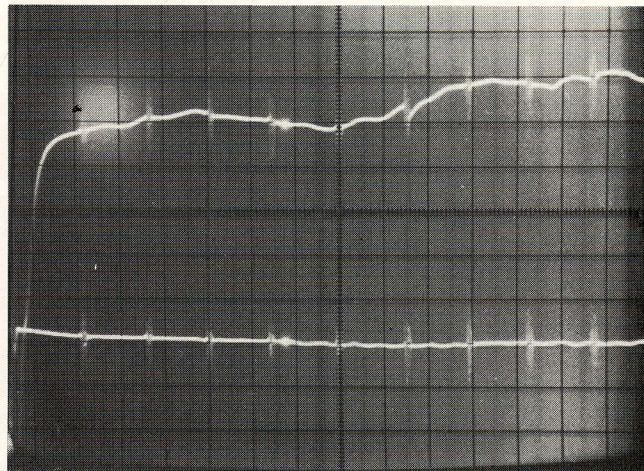


FIGURE 6

Frequency Response Cal-Amp model C07952; markers are 100 MHz apart and 500 MHz is at center. Vertical scale is 3 dB per division. Reference level is +4 dB.

#### Test Receiver Calibration

In order to deliver a clean picture, a satellite receiver must have both a **minimum amplitude** and a minimum signal to noise (ratio) on each transponder. Dealers wishing to "calibrate" a selected block receiver should configure a dish and LNB at their shop that is comparable to the system being installed (**same** antenna size, **same** LNB temperature, aimed at the **same** satellite). Care should be taken in the cable selection to keep track of the dB-per-100 foot losses. The antenna should be peaked on the Galaxy 1 satellite. **Figure 10** illustrates the test configuration required to "calibrate" a test receiver. The signal level of the 8.5 watt satellite transponder is annotated at each interface from the satellite to the receiver.

Network Communication Services has sweep tested several makes of UHF step attenuators and recommends the **Channel Master 7270**. Roughly 80% of the (7270) attenuators tested maintain a flat frequency response over the

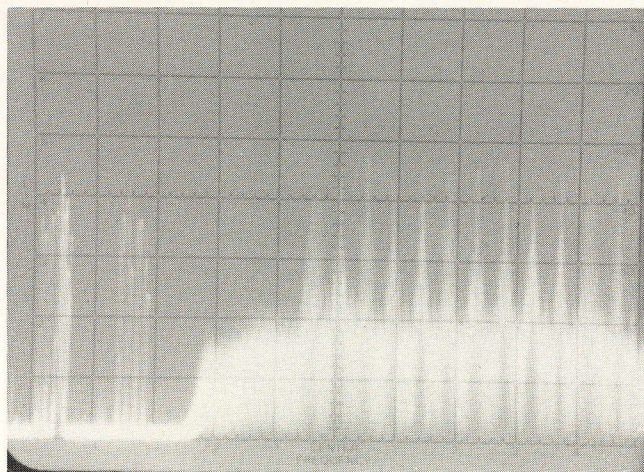


FIGURE 7

DC to 1 GHz display of signals to be distributed by 'CTN' system (see CSD for August 01). VHF carriers (channels 7, 9, 11, and 13) at far left.

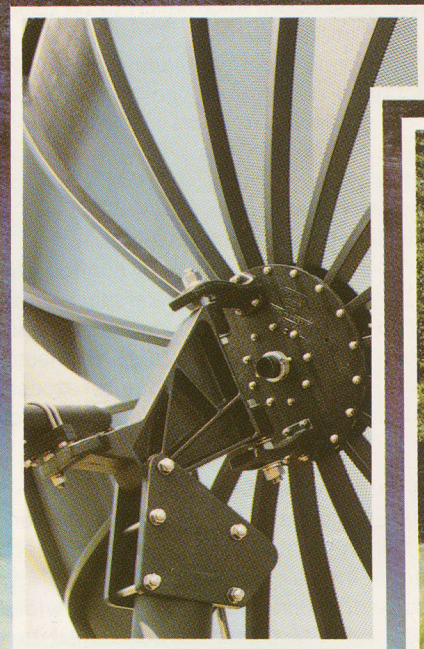


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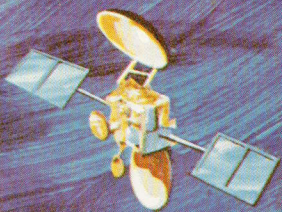
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FIGURE 8

Frequency Modulated NTSC Color Bar Signal from a Newton GBS-2600 processed by a TX Engineering DC-24 Block Down-converter. Horizontal scale is 5 MHz per division while vertical scale is 10 dB per division.

entire range of block frequencies. The dealer should be advised that the following "calibration" is based on the **assumption** that each system component is operating per manufacturer's specification. A spectrum analyzer is required to provide an **absolute calibration** of a block receiver.

Once the dealer is satisfied that his test set-up is fully operational, he should substitute several block **receivers** and observe the picture quality obtained on each transponder. The step attenuator should be set for (15 dB) of attenuation in order to provide the test receiver with approximately 0 dBmV of signal on the upper channels. The receiver selected for "calibration" should provide near equal quality pictures on all the transponders.

#### IF GAIN ADJUSTMENT

The following receiver adjustment is made to "center" the

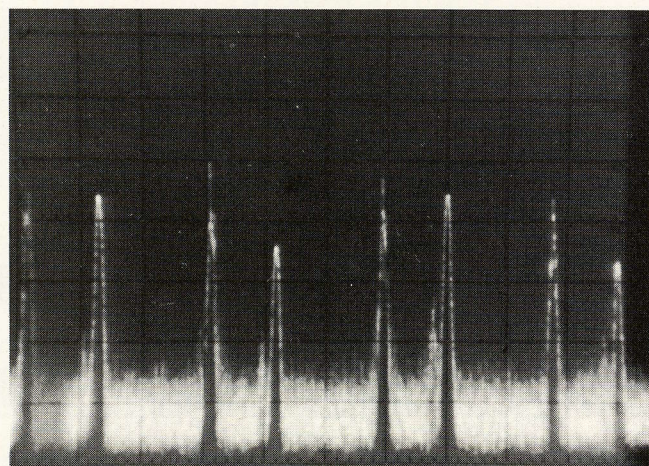
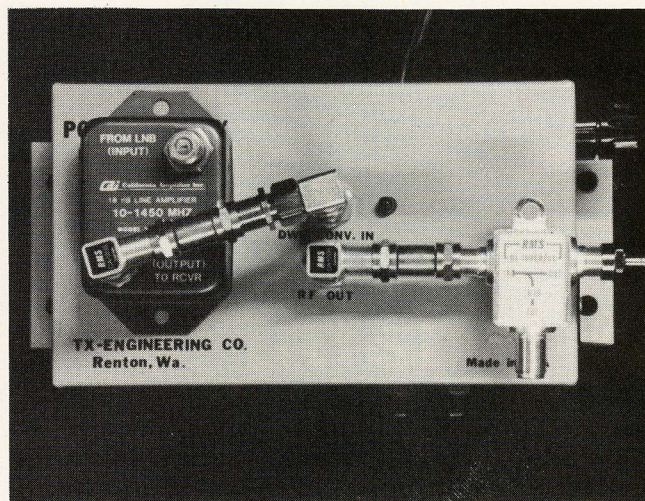


FIGURE 9

Amplitude Modulated TV signals; each 'AM' signal consists of a 'video spike' (numbers 1, 3, 5, and 7 from left to right) and a lower level 'audio spike' (numbers 2, 4, 6, and 8 from left to right). Horizontal scale is 5 MHz per division while vertical scale is 10 dB per division.



#### SIMPLIFIED BDC TEST HEADEND

receiver meter to **midscale** for an approximate 0 dBmV level input. Dealers should contact the receiver manufacturer for the location of the IF Gain Adjustment potentiometer.

While observing the television picture **and** the receiver meter, **adjust the IF Gain** to place the meter indicator at

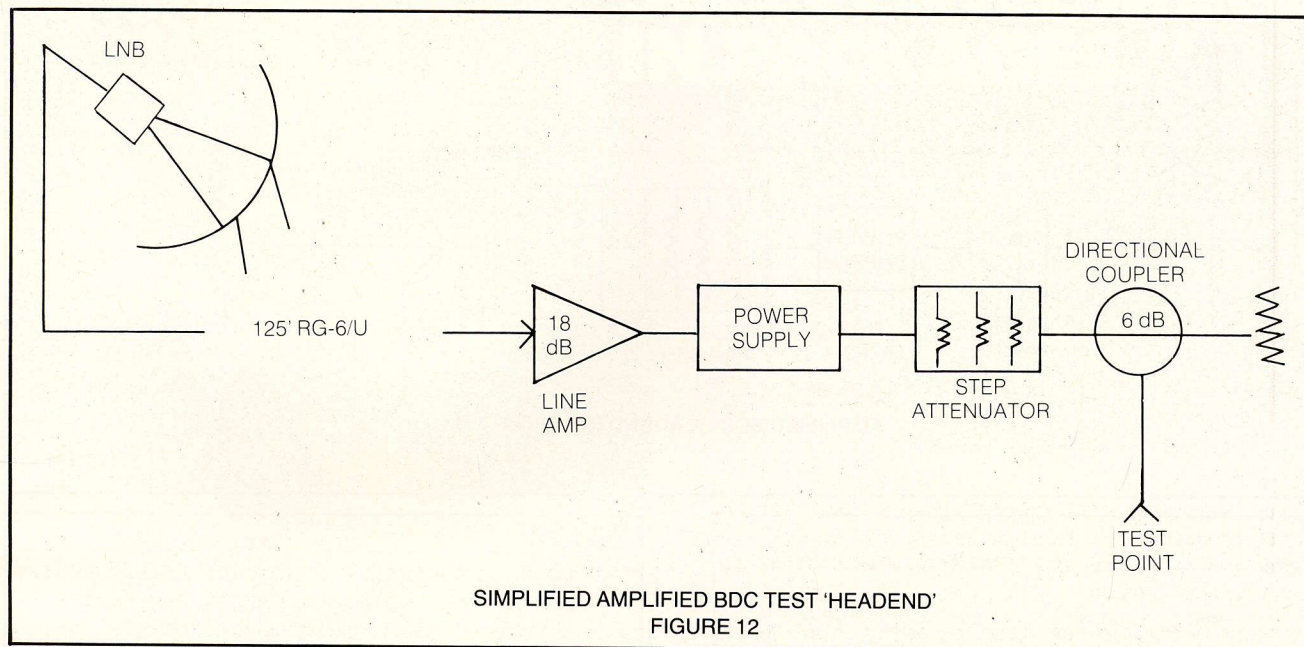
CHANNEL	ATTEN	METER PEAK	S/N LOSS Y/N	PICTURE RATING
1	3	10	N	E
1	6	9	N	E
1	9	8	N	E
1	12	7	N	E
1	15	6	N	E
1	18	4	Y	G
1	21	2	Y	F
2	3	10	N	E
2	6	9	N	E
2	9	8	N	E
2	12	7	N	E
2	15	6	N	E
2	18	4	Y	G
2	21	2	Y	F
21	3	10	N	E
21	6	9	N	E
21	9	8	N	E
21	12	7	N	E
21	15	6	N	E
21	18	5	Y	G
21	21	3	Y	F
23	3	9	N	E
23	6	8	N	E
23	9	7	N	E
23	12	6	N	E
23	15	5	Y	G
23	18	3	Y	F
23	21	1	Y	P
24	3	9	N	E
24	6	8	N	E
24	9	7	N	E
24	12	6	N	E
24	15	5	Y	G
24	18	3	Y	F
24	21	1	Y	P

FIGURE 11

#### BLOCK RECEIVER CALIBRATION TABLE

A complete channel by channel calibration is recommended.





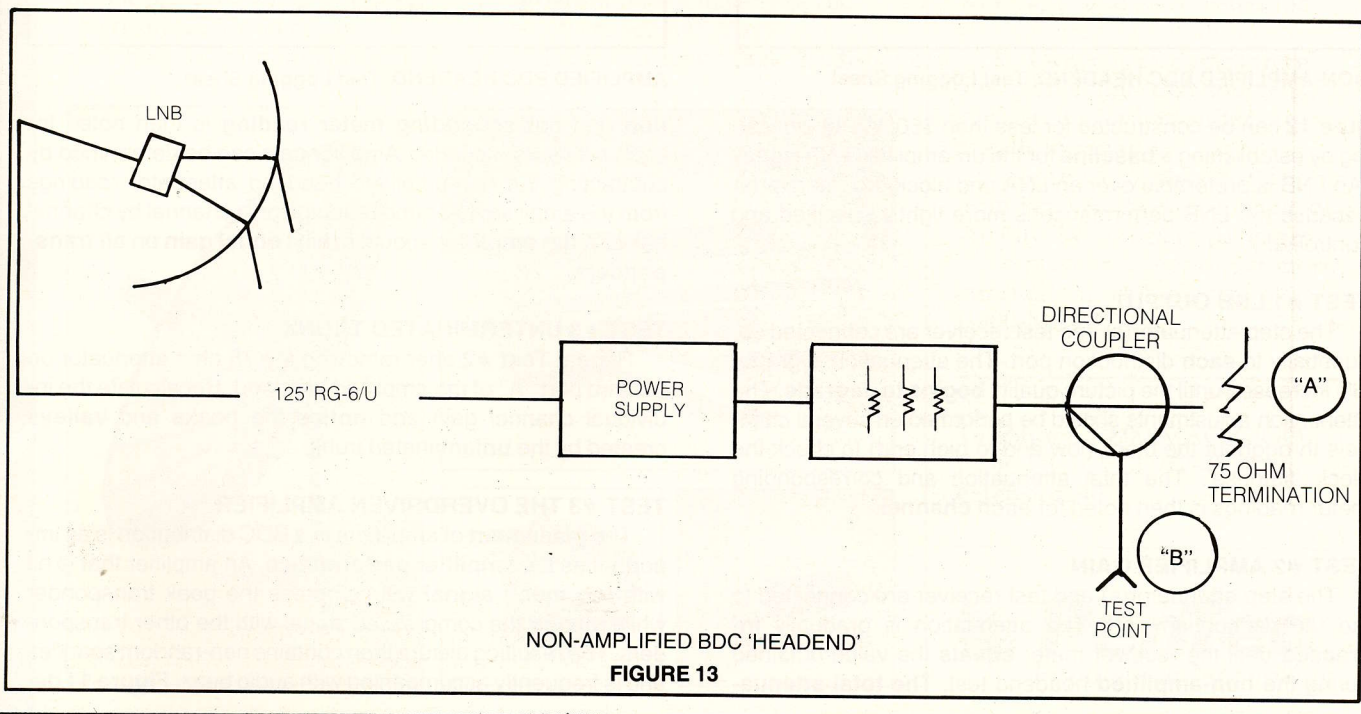
**midscale.** No loss of picture quality should be observed. If the picture degrades as the gain is lowered, **increase the IF Gain to maximum then slowly reduce the gain until the picture just starts to degrade.**

A tabulated transponder by transponder record provides the calibration for the test receiver connected to the test antenna. The table includes the picture quality and the receiver meter reading for various attenuator settings of **each transponder**. Most consumer TVRO receiver meters have a limited measurement range. **The use of a calibrated step attenuator at the receiver input provides the technician with**

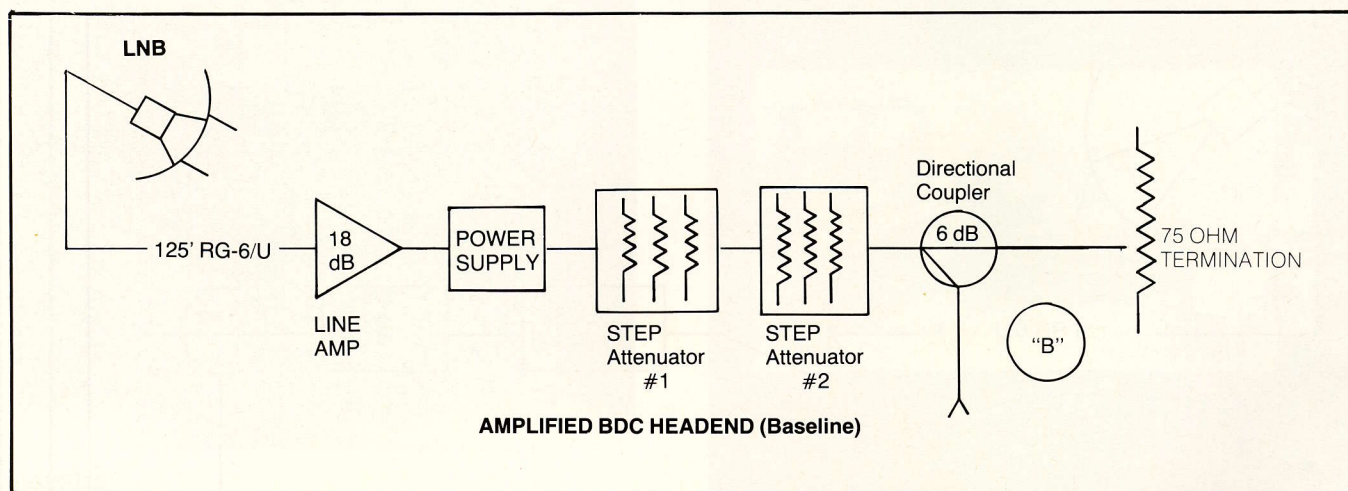
**a means of extending the meter's dynamic range.** The IF Gain should be adjusted to provide the maximum meter movement over the attenuator range that provides Excellent to Fair picture quality. A receiver that has a **flat frequency response** will indicate **the same attenuation on each transponder** before picture degradation occurs. **Figure 11** is an abbreviated table representative of a block receiver on a 12 foot antenna aimed at Galaxy 1, with an 85 degree 65 dB gain LNB, in Seattle, Washington.

#### THE BDC TEST BENCH HEADEND

A simple BDC Headend such as the one illustrated in fi-







ANTENNA _____		LNB SN _____	
PORT	CHAN.	ATTEN.	METER PEAK
B	1	18	4
B	3	18	4
B	7	18	4
B	9	18	4
B	11	18	5
B	13	15	4
B	15	15	5
B	17	15	5
B	19	12	4
B	21	12	4
B	24	12	4

**NON-AMPLIFIED BDC HEADEND/ Test Logging Sheet**

Figure 12 can be constructed for less than \$50. We begin testing by establishing a **baseline** for the un-amplified LNB signal. (An LNB is preferable over an LNA and block downconverter because the LNB performance is more tightly specified and controlled.)

**TEST #1 LNB OUTPUT**

The step attenuator(s) and test receiver are connected sequentially to **each** distribution port. The attenuation is gradually increased until the picture quality **begins to degrade**. The attenuation adjustments should be performed on several channels throughout the block (low end to high end) to check the block 'flatness'. The total attenuation and corresponding meter readings is then noted for **each channel**.

**TEST #2 AMPLIFIER GAIN**

The step attenuator(s) and test receiver are connected to the tap distribution port. The attenuation is gradually **increased** until the receiver meter **equals** the value obtained during the **non-amplified** headend test. The **total attenua-**

ANTENNA _____		LNB SN _____	
PORT	CHAN.	ATTEN.	METER PEAK
B	1	36	4
B	3	36	4
B	5	36	4
B	7	36	5
B	9	33	4
B	11	33	4
B	13	33	4
B	15	33	4
B	17	33	4
B	19	33	5
B	21	30	4
B	21	30	4

**AMPLIFIED BDC HEADEND/ Test Logging Sheet**

**tion** and **corresponding meter reading** is then noted for each active transponder. Amplifier gain can be determined by subtracting the non-amplified headend attenuator readings from the amplified headend readings on a channel by channel basis. A **flat amplifier** should exhibit **equal gain** on **all transponders**.

**TEST #3 UNTERMINATED TRUNK**

Repeat **Test #2** after removing the 75 ohm attenuator on the thru port "A" of the amplified headend. Recalculate the individual channel gain and **notice** the **peaks** and **valleys** created by the **unterminated trunk**.

**TEST #3 THE OVERDRIVEN AMPLIFIER**

The **placement** of amplifiers in a BDC distribution is as important as the **amplifier performance**. An amplifier that is hit with **too much signal** will compress the peak transponder while **mixing** the compressed signal with the other transponders. The resulting picture then contains non-random sparkles and is frequently accompanied with audio buzz. **Figure 11** de-



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to work together.

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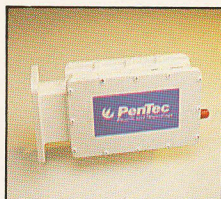
From our new Magic-10 dish

and LNB, to the Alpha receiver and Omega positioner, it's a complete system—including the only cable that's UL listed for satellite use to tie it all together.

And since it all comes from one source, and that source is PenTec, it's easy to order, and installs in minutes.

The Alpha/Omega system from PenTec. Now the magic of satellite TV comes in packages.

To place an order or get more information, call toll-free 1-800-MAGIC-GO.



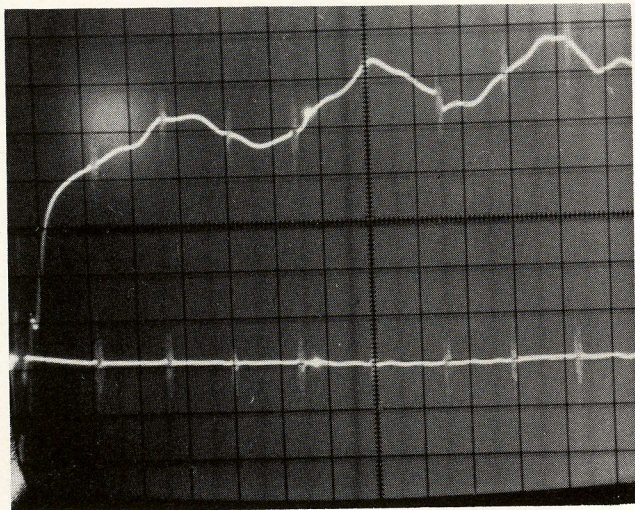
Telephone 1-800-MAGIC-GO.  
From Utah, call 972-4817,  
extension 401.

**PenTec**  
People and Technology



monstrated a method of determining if an amplifier is being overdriven. The test is based on measurements made by Network Communication Services to determine that BDC amplifiers **can** operate cleanly (less than -40 dB added distortion), and under what conditions.

The out of band noise created by amplifier compression can also be seen **above and below** the blockconverted satellite band. **Figure 20** and **figure 21** show the mixing of the satellite band and the VHF band.



ANTENNA		LNB SN		
PORT	CHAN.	ATTEN.	METER	PEAK
B	1	36	4	
B	3	36	4	
B	5	33	4	
B	7	33	5	
B	9	30	4	
B	11	30	5	
B	13	33	5	
B	15	33	4	
B	17	30	5	
B	19	30	4	
B	21	27	4	
B	24	27	4	

**FIGURE 15**  
FREQUENCY RESPONSE of unterminated trunk-amplified BDC headend with test logging sheet.

#### Minimum Equipment Requirements Basic Tools

The technician aligning and testing a cable distribution system should carry a complete set of connector tools for both flexible coax and hardline coax. **The most common problem with cable systems is improperly installed connectors.** Hardline connectors require fairly large, open ended, wrenches for installation. Crescent wrenches and pipe

## See Panasonic® Satellite Equipment at these Distributors:

Birdfinder Corporation  
Sarasota, Florida  
813-955-9280

Home Satellite Systems/  
Cable TV Supply Co., Inc.  
Los Angeles, California  
213-202-2746

Centennial  
Yonkers, New York  
914-476-2100

Consumer Satellite Systems Inc.  
Noblesville, Indiana  
317-845-4400

Echosphere Corporation  
Englewood, Colorado  
303-761-4782

High Frontier Distribution  
Tempe, Arizona  
602-966-9824

International Video  
Communications Corporation  
North Little Rock, Arkansas  
800-643-5427 - Outside Arkansas  
501-771-2800

Intercontinental  
Products Corporation  
Salt Lake City, Utah  
800-525-5959

Kelgo International, Ltd.  
Norcross, Georgia  
404-447-9450

National Satellite Communications  
Clifton Park, New York  
518-383-2211

Recreational Sports & Imports, Inc.  
Idaho Falls, Idaho  
208-523-5721

Satellite Earth Stations East, Inc.  
Mamou, Louisiana  
800-762-2110

Satellite Engineering Group, Inc.  
Kansas City, Missouri  
816-921-1555

Satellite Receivers Ltd.  
Green Bay, Wisconsin  
414-432-5777

Satellite Reception Systems  
Athens, Ohio  
800-592-1956

Satellite Television Systems  
Sandy Springs, South Carolina  
803-261-8209

Satellite Video Services, Inc.  
Catskill, New York  
518-678-9581

SRC Industries  
Ontario, Oregon  
503-889-7261

Star-Com Distributing  
Big Spring, Texas  
915-263-7512

Startech, Inc.  
Salem, Virginia  
703-387-0062

Warren Supply Company  
Sioux Falls, South Dakota  
605-336-1830

Southern Electronics, Inc.  
Tucker, Georgia  
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# Panasonic Industrial Company



# Panasonic® Satellite Receivers.

## From boardroom to living room.

From the coast-to-coast teleconference to the latest in home-viewing . . . Panasonic satellite receivers and quality "matched components" are delivering our message loud and clear.

We've got satellite reception equipment for any application.

So get down to business with our formidable industrial Ku/C-6000 receiver. As attractive as it is rugged, this rack-mountable unit is ideal for teleconferencing, SMATV systems and dozens of industrial uses.

Moreover, it offers the same versatility and shares many of the features of our C-2000 satellite receiver.

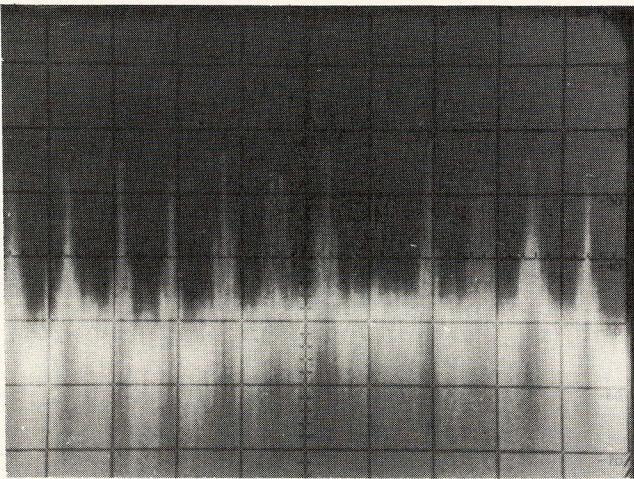
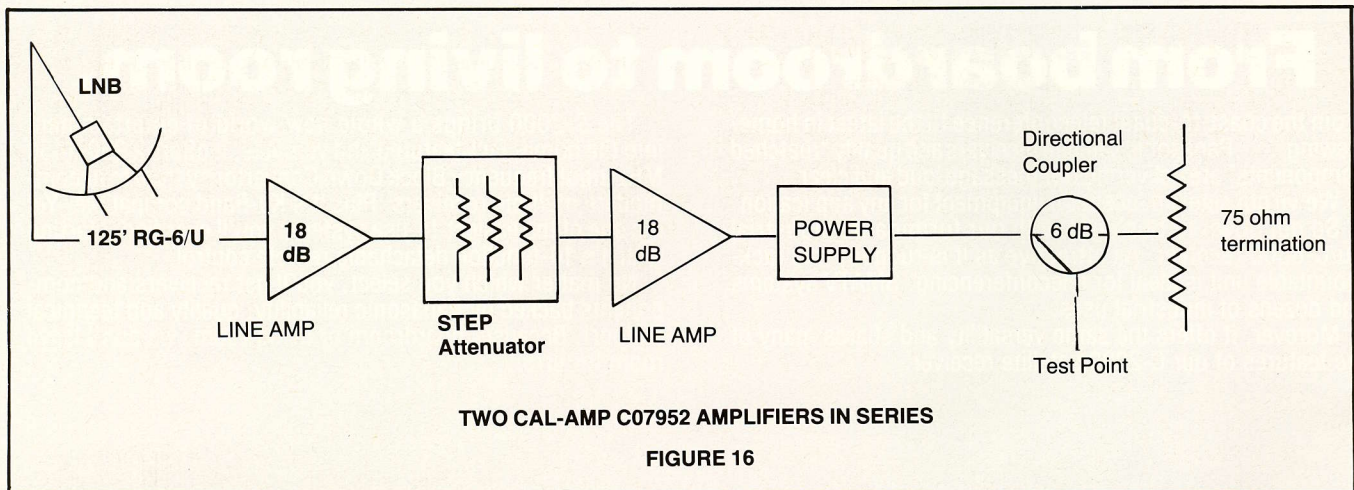
The C-2000 brings a whole new world of entertainment into the home. Full-featured and versatile, it offers a 950-1450 MHz input frequency Block Down Converter system to accommodate multiple receivers. Plus it's Ku-Band compatible. Yet it's one of the easiest-to-use systems you'll ever find, starting with its 10-function detachable remote control.

No matter which you select, you'll get receivers and components backed by Panasonic reliability, quality and technical support. Because, boardroom or living room, we don't leave room for error.



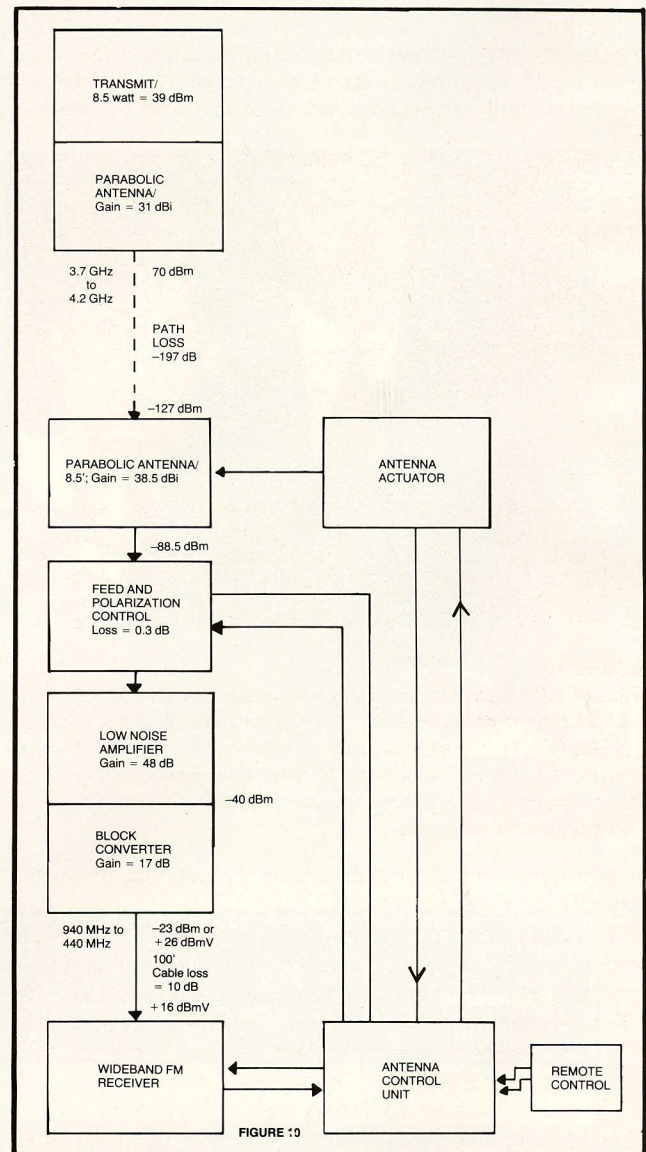
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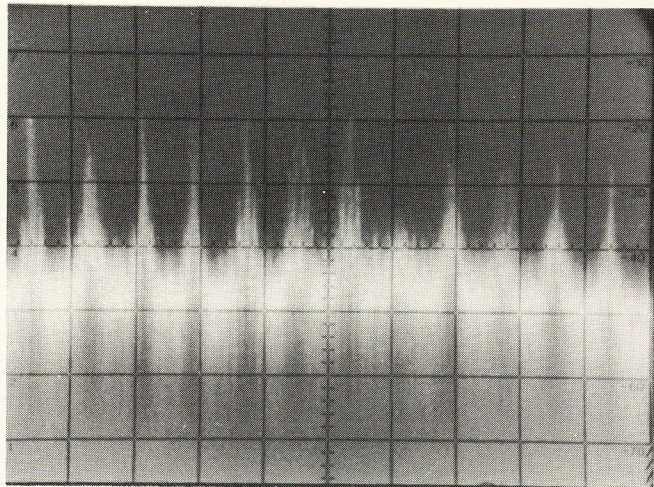
ANTENNA		LNB SN		
PORT	CHAN.	ATTEN.	METER	PEAK
B	1	21	9	
B	3	21	9	
B	5	21	9	
B	7	21	8	
B	9	21	9	
B	11	21	9	
B	13	21	8	
B	15	21	9	
B	17	21	7	
B	19	21	7	
B	21	21	7	
B	24	21	6	

**FIGURE 17**  
FREQUENCY RESPONSE Dual Line Amp Signal BEFORE undesirable signal compression.

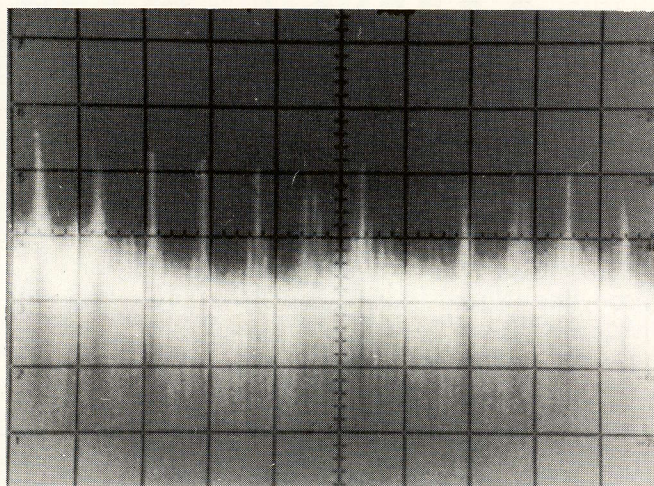


wrenches are not recommended. A number of flexible **coax preparation tools** are available that not only save time but





**FIGURE 18**  
**FREQUENCY RESPONSE** Dual Line Amplifiers with 6 dB of undesired signal compression. Markers at 100 MHz (horizontal) and 500 MHz is center frequency. Vertical scale is 3 dB per division.

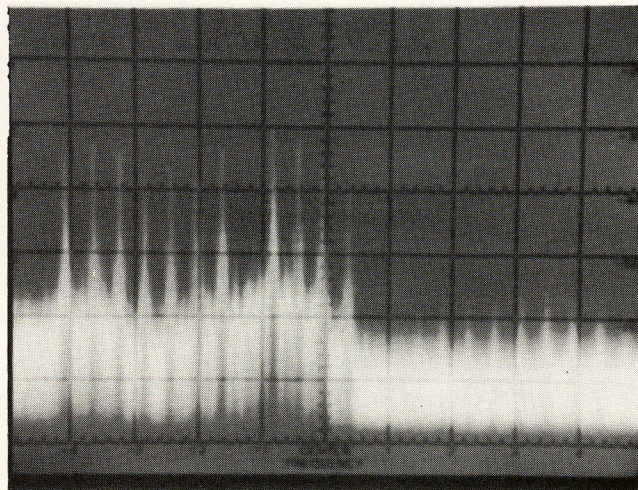


**FIGURE 19**  
**FREQUENCY RESPONSE** Dual Line Amplifiers with 12 dB of undesired signal compression. Markers are 100 MHz (horizontal) and 500 MHz is center frequency. Vertical scale is 3 dB per division. Note increased 'waviness' to response lines and thickening of the baseline noise indicating compression and undesirable intermodulation products.

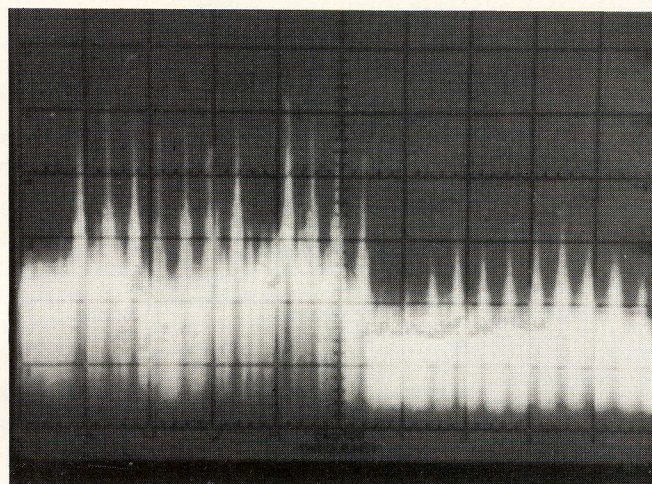
also provide repeatable connections. I personally prefer the **Paladin** at approximately \$35.

A battery powered multi-meter is indispensable for field work. A good unit should be able to read accurately in bright sunlight and provide scales for measuring AC volts, DC volts, DC milli-amps, and DC resistance. The **Fluke 77** has proven to be a rugged and dependable field meter. It provides both an analog and digital readout.

A battery powered **soldering iron** can prove very useful when making field replacements. A battery powered **Field Strength Meter** is indispensable in measuring the performance of a VHF cable distribution system. CATV field strength meters are designed to measure amplitude modulated TV sig-



**FIGURE 20**  
Mixing of satellite band and VHF band signals with 6 dB of compression. Note imaging at right.



**FIGURE 21**  
With 12 dB of undesired compression, note increase in imaging (right hand side) and intermixing of VHF AM signals with wider bandwidth FM signals (left).

nals only. CATV field strength meters **DO NOT** measure FM satellite signals accurately or repeatably.

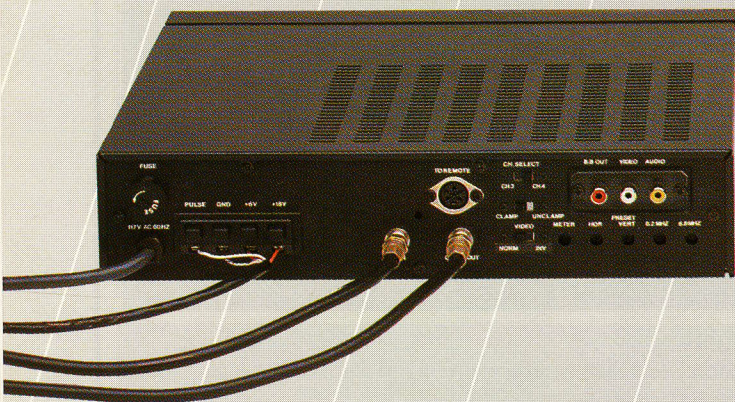
For the professional installer, the time saved through the use of a spectrum analyzer is well worth the cost. With the flip of a switch the entire spectrum of distributed signals is seen on the display. The installer can either look at the entire spectrum or zoom in on a particular signal for detailed analysis. In addition to the signal peaks, the noise floor can also be observed with the spectrum analyzer. Problems such as **overdriven amplifiers** can be traced to **an increase in the noise floor** without a companion increase in the signal peaks. the **TEXSCAN VSM-2** is useful for both the local VHF signals and for the block of satellite signals in the (450 to 950) MHz band.

#### SPARES

Before going to the site the technician should stock the various hardline connectors for size and type of hardline



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If you remember when installing a satellite receiver required an engineering degree, you'll appreciate the ease of installing the new Satstar Elan Satellite Receiver.

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Company \_\_\_\_\_ Phone \_\_\_\_\_

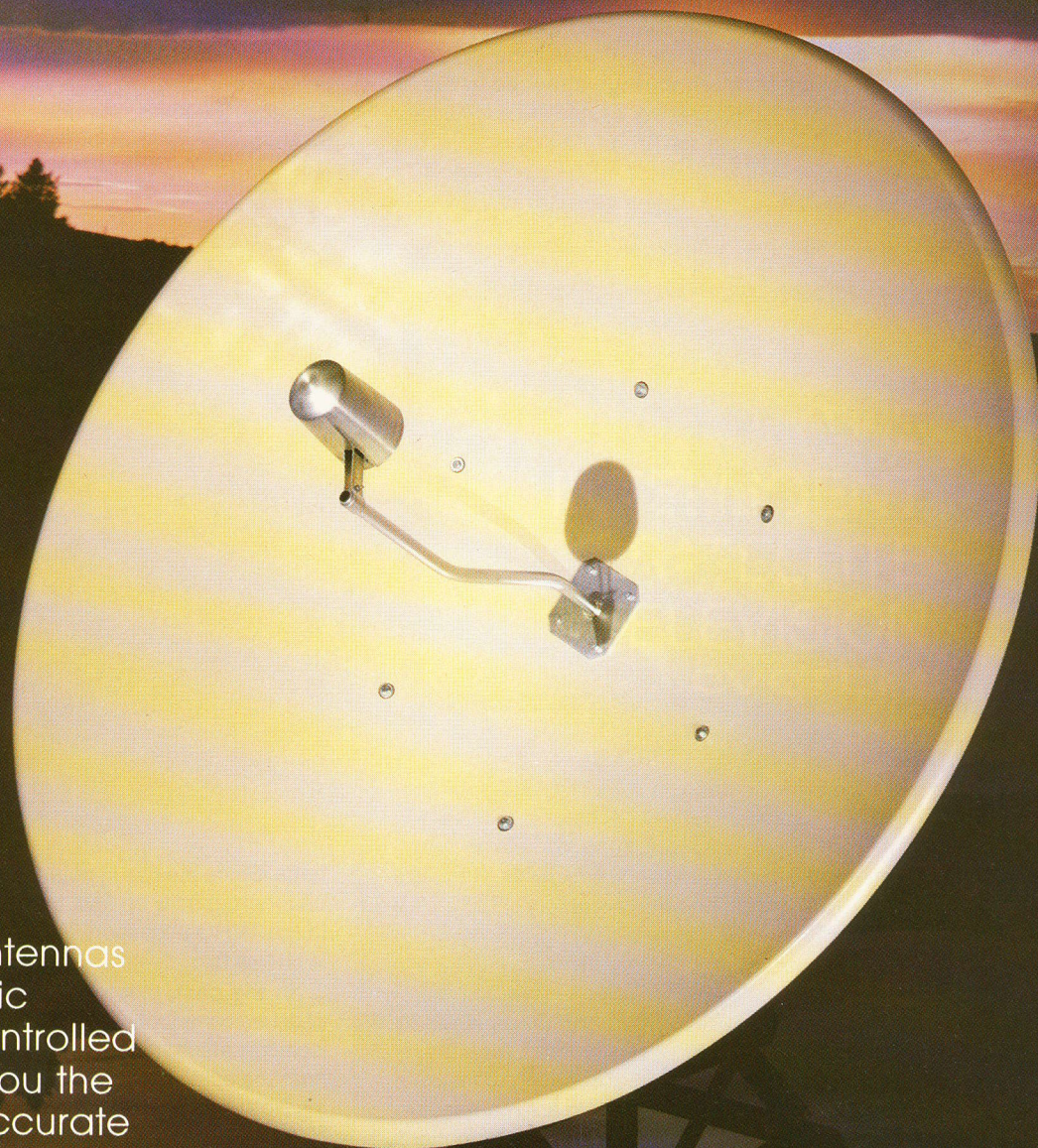
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cable. It is important that the connectors **exactly** match the cable. The technician should also stock the flexible "F" fittings for the size of drop cable being used. Professional grade fittings will have **one half inch crimp rings attached to the fitting**. A selection of test RG-6 jumpers is handy in addition to a **150 foot length** of RG-6 to use as **substitute drop cable**. The spares kit should also contain hardline splice blocks and F71, F81, and right angle "F" splice connectors. Seventy five ohm

terminators for both hardline and "F" fittings should be available at the site.

Armed with the necessary tools, spares, and test bench receiver calibration, the technician can then repeat the tests performed in the shop. The non-amplified headend signal can be tested and compared to the results obtained on the shop system.

## CAL-AMP FOLLOWS 'K.I.S.S.' APPROACH

### MAKE THE SWITCH SIMPLE

There is a widely known principle in design and engineering, KISS, "Keep It Simple, 'STUPID'." This is a good rule to follow. The first cold winter night you spend working on someone's faulty satellite system will convince you of this. Hard as it is to believe, there are design engineers working in the TVRO field who have **NEVER** installed a satellite system! So it's up to you, the dealer/installer, to look for products that follow the KISS rule.

The pursuit of multiple receiver and SMATV systems by the progressive dealership is not an easy road. It requires in-depth understanding and careful cost accounting to insure a profit, but it's worth it! Especially when there are manufacturers and dealers willing to help with products and information.

**Heifner Communications, Inc.**, based in Columbia, Missouri, has been an installer of SMATV systems and custom residential systems since 1980. With their SMATV background they have begun installing quite a few multiple receiver sys-

An ingenious 'lossless switch' popped up in the California Amplifier booth back at the Las Vegas trade show. Not everyone understood then, or understands now, why such a product was brought to market. We assigned SMATV installer **Greg Heifner** to the project and his report reads as a cross between his own casual style of speech and the hard earned words of advice you would obtain only from a dealer who has been in this crazy industry for five years or so. Cal Amp has a neat device here and Heifner tells us why.

by

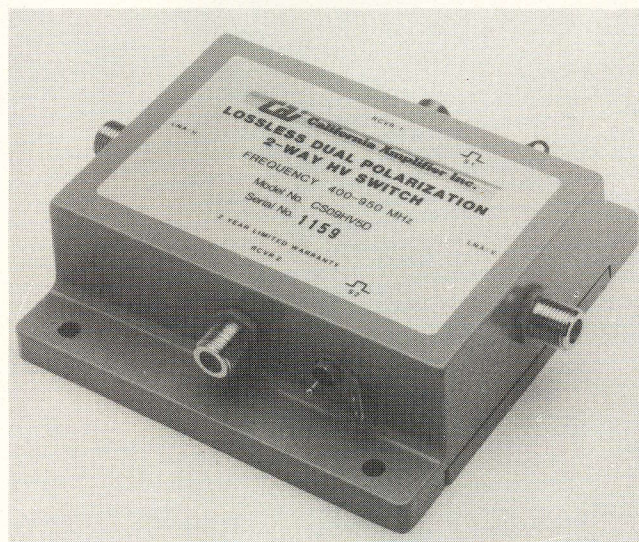
**Greg Heifner**

**Heifner Satellite Communications, Inc.**

**114 Clinkscates**

**Columbia, MO 65203**

**(314/445-6163)**



tems. Since the rise in popularity of these systems, with full 24 channel capacity on-line, there arose a need for a new product in the TVRO accessory field: namely, the dual feed switch or V/H switch.

In the past, these switches were rigged affairs using A/B switches commonly in use for RF switching. They were all high isolation mechanical switches that had to be mounted on or near the satellite receiver using a pair of coax lines containing both odd and even feeds. There was little provision for a clean retrofit to a receiver and no provisions for remote operations. Several companies were manufacturing switches that were relay operated in the 4 GHz region to be used in conjunction with microwave power dividers. These systems offered the first on-line dual polarity systems that could be remotely controlled, leaving the satellite receivers with simple toggle or push button switches to make polarity changes. Unfortunately, these switches did not pass DC current and were quite expensive when considering that you needed two microwave power dividers, two power inserters and a power supply to make the system work.

When block downconversion ignited the multiple receiver market, a number of V/H switches using pin-diodes entered the market. Designed to work in their respective systems, many of these switches were DC passive (they would pass DC current through the switch to the BDC and LNA) eliminating the need for power inserters and extra power supplies, and indeed many were remotely controlled by the receivers. This was done either through the polarizer circuit or a voltage applied

KISS/ continues on page 35



L U X O R 9 9 0 0

THE  
INTELLIGENT  
SATELLITE  
TELEVISION  
SYSTEM



# THE LUXOR 9900 KNOWS

## **Where all the satellites are**

Up to 36 satellite locations can be programmed for instant recall. The antenna controller is integrated into the satellite receiver. The hand-held remote control activates a 3-speed actuator action which precisely locates the satellite and fine tunes the antenna position for maximum signal reception.

## **Where all the channels are**

Every channel on every satellite is individually factory programmed prior to delivery. All audio and video information is ready for recall automatically. As new channels are added they can be added to the program. The 9900 is ready to receive individual channel selection information for up to 864 separate selections.

## **All about stereo Hi-Fi sound**

5 audio modes, factory programmed to individual transponders, deliver the right sound system automatically when a channel is selected. Dozens of audio subcarriers can be added to the program for audio only hi-fi enjoyment (including Dolby® Noise Reduction) in addition to television.



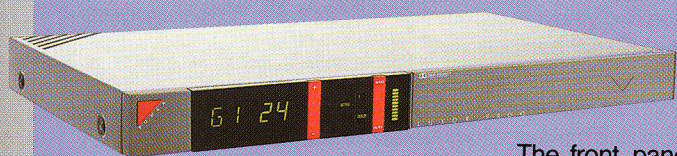
**ALL YOU NEED TO KNOW IS  
WHAT SHOW YOU WANT TO WATCH**



L U X O R 9 9 0 0

## NOW LUXOR HAS UNIFIED SATELLITE, VIDEO, AUDIO AND COMPUTER TECHNOLOGY IN A SINGLE INTEGRATED HOME SATELLITE TV SYSTEM

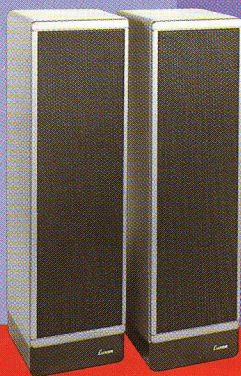
### So advanced it's as easy to operate as an ordinary TV



The front panel LED display tells you what satellite you're on, what channel you're watching, what sound system you're receiving and a signal bar graph indicates signal strength. All functions are controlled from the hand-held wireless remote.

### The sky is alive with the sound of music

Luxor loudspeakers bring new life to TV audio, mono or stereo, and much more. Satellite audio sub-carriers broadcast a wide range of music for audio only. These optional high quality 6-speaker sets (3 per side) are available in passive or active models with sound power up to 40 W per channel. They are specially magnetic shielded for close location to your TV set.



### Simple, clear and color-coded



The Luxor hand-held remote is clearly organized to make life easy. Distinctive color sections present satellite and channel selection functions, tuning functions and switching functions. For most viewing however, video and audio delivery will be automatic. When a channel is selected, the exclusive Luxor Micro-Step™ Tuning System (LMS) automatically seeks out the right signal within that channel's frequency. The receiver automatically compensates for any form of frequency drift due to climate or transponder variances.

An internal TI filter can be assigned to individual channels to minimize terrestrial interference.

And a discrete parental lock-out can eliminate one or more individual channels on a single satellite, as desired.

That's it. Advanced Luxor technology has produced a system so simple to operate, yet complete enough to satisfy the most fanatic videophile and audiophile. For the technician, the Luxor 9900 even has its own diagnostic system built-in and ready at the touch of a button.

Here is the best of Scandinavian design and high technology. Because Luxor is a leading European manufacturer of satellite products, TV's, audio hi-fi systems, and computers, the company is able to combine these technologies in the advanced 9900 series. After all, Luxor has been a leader in radio, television and electronic technology since 1923.

### The perfect companion



The Luxor Model 9995 Block Satellite Receiver is designed and built to function as an add-on receiver to Luxor 9900 multiple TV's installations. This low cost manually operated receiver offers independent channel selection for TV's located throughout the house. The 9995 can also be used as a stand-alone receiver for both C-Band and Ku-Band reception.



# LUXOR HAS ADVANCED THE STATE-OF-THE-ART TO THE POINT OF ELEGANT SIMPLICITY FOR THE CONSUMER AND THE TECHNICIAN

Each electronic innovation is incorporated to aid ease of operation, assure high performance reliability, and maintain outstanding quality of both picture and sound.

## 9900 Block Receiver

### Control Functions

- + Integrated satellite receiver and antenna controller.
- C-band (4 GHz) and Ku-band (12 GHz) capable. Remote control switchable.
- Satellite direct access.
- Transponder direct access.
- + Built-in A/B switch.
- + "Normal" button return to factory pre-set values.
- Built-in polarotor drive.
- Built-in RF modulator.
- Non-volatile memory unaffected by power outages.
- Remote sensor interface.

### Programs

- + Factory programmed for individual transponders on each satellite.
- + Automatic correct audio system factory programmed for each satellite and each transponder.
- + Program capacity up to 864 individual selections, audio video matched and fine tuned.
- + Self-diagnostic microprocessor.
- + LED display of satellite, channel, audio system and signal strength

### Video Functions

- + Luxor Micro-Step™ tuning system (LMS).
- Baseband audio and video output for VCR or monitor.
- + Baseband input for other video sources.
- Built-in polarity control.
- + Built-in programmable TI filter.
- Raw video (unfiltered, unclamped) for descrambler connection.

### Audio Functions

- + Audio subcarrier frequency read-out.
- Wide/Narrow Bandwidth selection.
- + Remote audio volume control.
- + Remote stereo balance control.
- + Remote Dolby® on/off
- + 5 audio modes—2 mono, 2 matrix, and discrete stereo. Automatic multiplex selection.
- Built-in stereo processor.
- + Direct loudspeaker drive.



## 9902 Remote Sensor

- Controls satellite system from any room.
- Low-cost add-on for other TVs.
- Comes complete with hand-held IR remote control.

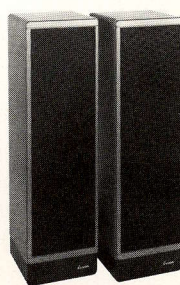
## 9901 Remote Control

- + Full-function, color-coded IR wireless remote control.
- + Remote ON/OFF
- + Discrete parental lock-out for individual channels.
- + Remote mute.
- + Volume control.
- + Stereo balance.
- Channel UP/Down.
- + Video fine tune.
- + Audio fine tune
- Antenna fine tune.
- Satellite selection.
- Channel selection.
- + Divided into 4 easy-to-read segments: Satellite selection, channel selection, tuning functions, switching functions.



## 9904 Actuator Interface

- + 36V power supply to antenna drive.
- + Surge protected.
- + Voltage spikes protected.
- + Design coordinated with 9900.
- + Can be wall-mounted out of sight.



## 9906/9907 Stereo Loudspeakers

- + Passive or active models.
- + Up to 40 W per channel.
- + 3 elements per side; tweeter, mid-range and woofer.
- + Magnetic shielded.
- + Automatic ON/OFF.
- + LED indicators; standby and active.
- + Complete with line cable feed.

## 9995 Block Satellite Receiver

- + Add-on "slave" to 9900 multiple TV's installations.
- + Can function as a stand-alone block receiver; C-band and Ku-band reception.
- + Manually operated channel selection.
- + Video fine tune. AFC defeat.
- + Built-in V/H switch.
- + Built-in antenna switch for satellite or local reception.
- + Preprogrammed audio frequencies 6.2 and 6.8 MHz.
- + Audio frequency selection 5.0 to 8.0 MHz.
- + Wide/narrow audio bandwidth selection.
- + Raw video output (unclamped, unfiltered) for descrambler connection.
- + External TI filter input.
- + Skew control.
- + Polarotor One control output.
- + Denotes new features available only on 9900 series products.



## Luxor High-Performance Microwave Block Downconverters

Designed and constructed for continuous reliable performance, each Luxor unit is individually inspected and tested against all specification requirements. The Block Downconverter (30 dB gain min.) is used in conjunction with an LNA. The LNB Block Downconverter (60 dB gain min.) is an LNA and a Block Downconverter in one compact package. Each unit is weather-tight, rust-proof and fully warranted.

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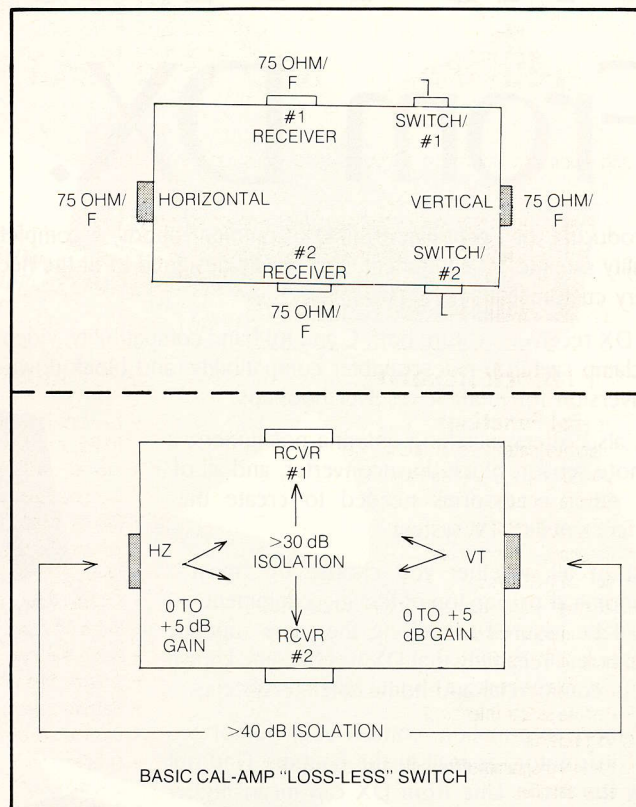
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from the feed cable to the dish.

Heifner Communication **quickly found** that not all receivers reacted properly to these switches. One initial problem occurred when one of their clients wished to connect an ARUNTA 418 INTERCEPTOR satellite receiver in conjunction with an ARUNTA QUARTZ satellite receiver. They had considerable experience with these two rather advanced units and knew that even though they were both BDC units, there was a problem in the way they switched their polarizer pulses to change a servo type feedhorn. Instead of a continuous string of pulses being emitted by the receiver when on one polarity, the pulses were discontinued after the polarizer had changed position. They then found that a lot of the motor drives with programmed polarity and format controls **also discontinued** the servo pulses **after** use. Most of the V/H switches that had previously been tried would not stay toggled in one position and would return to the "at rest" position when the polarizer pulses stopped. This meant that only one polarity was available at any one time. They decided they needed a "smarter" V/H switch.

A call was placed to **Ed Grotsky** at Arunta in Phoenix, Arizona. Ed had designed the Interceptor system and is one of the people who can be counted on to answer tough questions. He was asked about the California Amplifier switch that had just been released. His reply was that it should work and that he had just received a demo unit from Cal Amp; 'and would Heifner Communications like to do the evaluation?'

This new switch seemed to have the characteristics that would make it very easy to use and certainly one of the best on the market. It is available in three frequency configurations: low frequency block (400-950 MHz), **high** block (900-1450 MHz) and at 3.7-4.2 GHz for direct LNA switching. The units are internally balanced to switch signals between two independent satellite receivers and show **no insertion loss**. This is especially nice when amplification is critical for multiple tap cable runs at block frequencies. The switches are also **DC passive**, eliminating the need for any other parts in the switching system. The switch is activated by supplying just the **pulse line** off of the P1 polarity device built into the receiver/systems.



It does **not work** from signals meant for solid state ferrite feedhorns.

System setup is as simple as hooking the outputs of two BDC units or LNAs (one odd, one even) into the inputs of the Cal Amp switch. There are two outputs on each switch intended for two separate receivers. Two inputs for polarizer pulses for **each receiver** are provided. Also it would be wise to avoid the possibility of problems by using a **shielded line** to carry the polarizer pulses to reject any possible outside interference. That completes the installation. The DC power is provided through the receivers to the LNAs and BDC unit in the normal fashion. **Each** receiver powers **both** the vertical **and** horizontal side in such a way that power inserters and dividers are **totally eliminated**.

The ARUNTA equipment uses quartz synthesizing to tune channels. This is a fast and accurate method to tune satellite channels and with the Cal Amp switch, channel and polarity selection became virtually instantaneous. One of the most remarkable things that was noticed was that the ARUNTA receivers step through all 24 channels in the period of under a second when you go from channel 24 to channel 1. When the system was asked to do this with the dual feed setup and the solid state Cal Amp switch, it responded with 24 **very rapid** frames of different video going across the screen. The quartz tuning system is a fast channel changer, but the Cal Amp switch is fast enough to keep up with it!

A product that worked this well was of great interest to Heifner Communications. It made a difficult installation into an easy one. When that happens in TVRO it is well worth the time to investigate. **Dennis Schwabb**, of California Amplifier, asked Heifner to stop by for a tour.



# The Profit Line. From DX.

Introducing the Profit Line from DX Communications. A completely new line of high-quality satellite TV equipment, specifically designed to fit the needs and budgets of every customer.

All DX receivers feature both C and Ku-band compatibility, video clamp/unclamp switch for descrambler compatibility, and block down-conversion for multiple-receiver hookups.

DX also offers matching antenna positioners, a remote sensor, block downconverter, and all of the other accessories needed to create the perfect satellite TV system.

Best of all, whether you choose our most economical or our top-of-the-line equipment, you'll be assured of getting the same superior quality and reliability that DX has become known for in commercial and home satellite systems.

For more information, contact your authorized DX distributor, or mail in the coupon. Find out how the Profit Line from DX can mean higher profits for your store.

**NEW Satellite Receiver with Detent Channel Selector, DSB-600A**  
• Picture quality comparable to commercial receivers • 4 GHz and 12 GHz compatible • Decoder ready • Digital channel readout

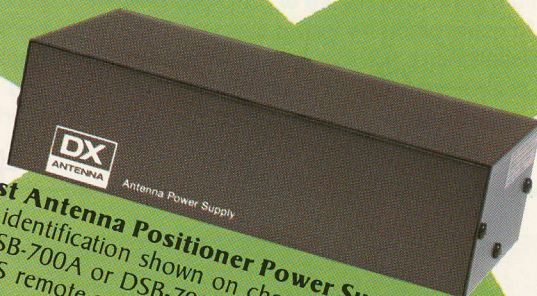
**NEW Remote-Controlled Satellite Receiver, DSB-700A**  
• Full-featured infrared remote control • 4 GHz and 12 GHz compatible • Decoder ready • Professional-type signal strength meter

**NEW Stereo Remote-Controlled Satellite Receiver, DSB-700S**  
• Stereo dual-channel audio tuning • Push-button selector for matrix and discrete stereo modes, with LED indicators • 4 GHz and 12 GHz compatible • Decoder ready



**NEW East/West Antenna Positioner Power Supply, DSB-300**

- Satellite identification shown on channel readout when used with the DSB-700A or DSB-700S
- Remotely controlled by the DSB-700A/S remote-control unit



**Deluxe Antenna Positioner with Total Remote Control, DSB-400A**

- 24-position fully programmable satellite and transponder information
- Programmable polarization and skew
- 10-year power loss memory retention



**NEW Satellite Receiver with Convenient TV-Type Tuner, DSB-500**

- Push-button C and Ku-band selector
- Comes complete with separate DSB-60 block downconverter
- Descrambler ready

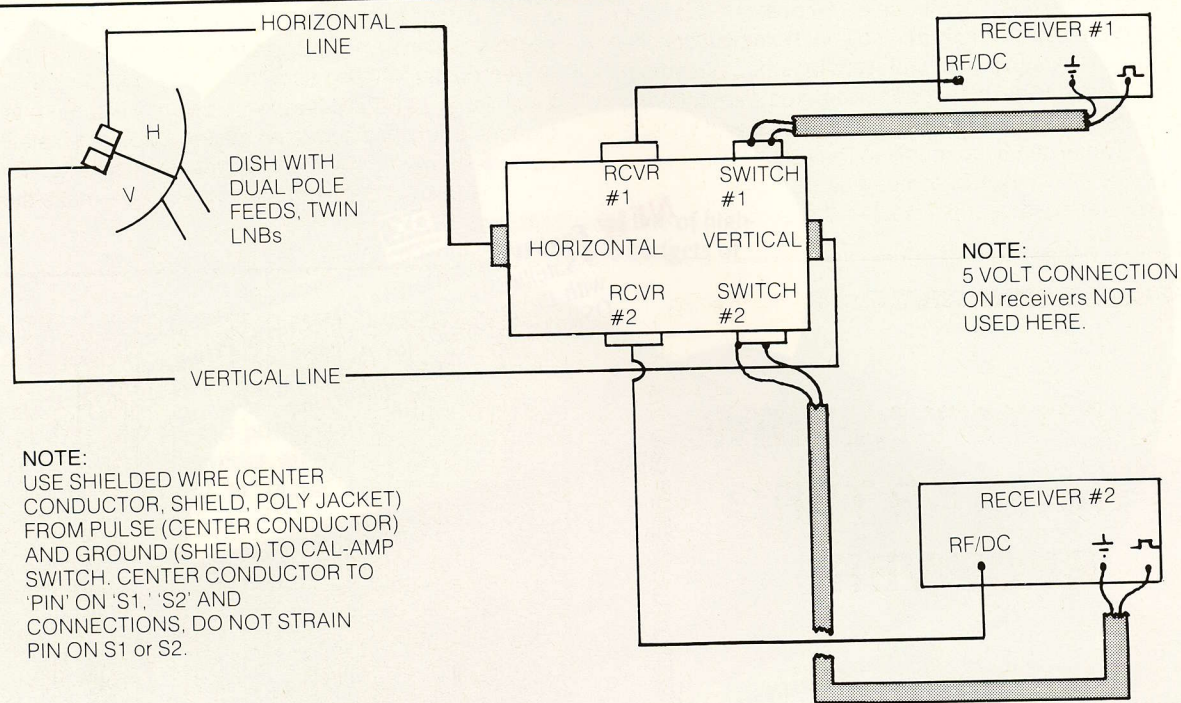


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A Subsidiary of C. Itoh & Co. (America) Inc.  
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TWO RECEIVER HOOK-UP WITH CAL-AMP SWITCH

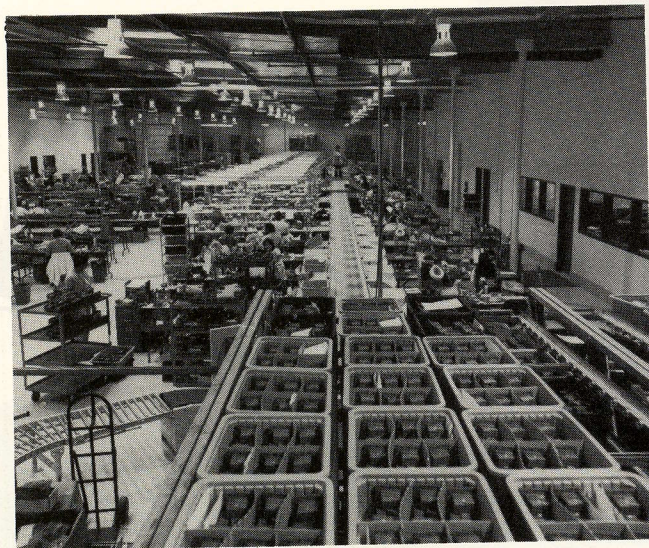
Dennis met them at the Cal Amp facility in Camarillo, California. The facility is large and very up-to-date, with the right mixture of automation and technicians monitoring the product for peak performance. It was quickly understood that this is one of the things that the people at Cal Amp pride themselves the most on: quality control and performance.

The engineering department, the people responsible for the switch and the other products that Cal Amp markets were introduced. **Ernesto Gold**, associate engineer, explained the concepts that are used in the design of the product. Ernesto explained that the switch can change feeds faster than their instruments can measure. Typically, depending on which frequency block used, the switches have the following specs:

- 1) 30 dB isolation between receivers
- 2) 0-5 dB overall insertion gain
- 3) 1 dB gain flatness
- 4) 40 dB isolation between H/V feeds
- 5) 15-28 VDC required
- 6) 60 mA current draw
- 7) "F" connectors
- 8) Waterproof housing

#### TROUBLE SHOOTING CAL-AMP SWITCHING SYSTEM

- 1) Receiver(s) does **not** operate?
  - A) Re-check all RF cables from LNB (s) to switch, switch to receiver(s). Remember: Most problems are improperly installed connectors.
- 2) Receiver operates **only one polarization?**
  - A) Re-check all pulse cable connections (center pin on S1, S2 using center conductor of cable). Check to be sure shield on pulse carrying cable is not shorted to pulse wire (tiny strand of shield shorting?)
  - B) Check 'skew control' for proper setting (feed if not electrically skewable may need re-positioning; if skewable, may require skew-tweaking).
- 3) System **only works** when BOTH receivers are turned on?
  - A) Current coming from receiver to switch is not adequate. This will also degrade operation of LNBS as well since the operating voltage feeds through the switch to the LNB as well. Solution is to use separate power supply with power inserter (typically 350 mA, 15 to 28 VDC) since receiver supply cannot handle load.
- 4) **Fuses burning out** in receiver DC side?
  - A) Check all RF cables for shorts.
  - B) Power supply cannot handle 'load'; add power inserter as suggested in 'C'.





thing in common—**hidden costs**. As a new dealer in this field, it is important to move carefully and do your homework on the design. Much of the equipment **will** work together, but sometimes there are additional components required, like isolators, power dividers, power inserters, power supplies, and voltage terminators. These items can push up the cost of the system rapidly. The Cal Amp switch becomes a bargain when you fully realize what you save by not needing these other compo-

nents. It can also improve system reliability by reducing the number of parts involved. Hookup time is also faster.

A modular building approach to the installation of multiple 24 channel TVRO systems was a very welcome piece of engineering. Anytime someone makes a dealer's installation job easier and more foolproof, he deserves a hand. This is just what the folks at Cal Amp are trying to do—make things simpler.

## EQUIPMENT REVIEW: PRO-STAR TVRO RECEIVER

### ERRATIC Beginning

The front cover on the brochure says "All you do is turn it on". The artwork depicts a small handheld remote control 'zapping' a beam of control information to the front display panel on a satellite receiver.

Unfortunately for **ProStar**, turning it on was not all they had to do to 'turn on the marketplace' to the latest **John Ramsey** designed TVRO receiver. Ramsey (see **CSD** for September 1984) has been a part of TVRO since he first appeared with legendary designer **Clyde Washburn** (Earth Terminals receiver) at the Miami SPTS show in February of 1980. Ramsey's design talents have been responsible for nearly 50,000 TVRO receivers sitting out there in American (and other) homes since that first appearance in the industry. Few would argue that John Ramsey does not know his way around the inside of a TVRO receiver.

The ProStar is an entirely new world for John Ramsey. It is the first Ramsey receiver to go offshore for production. And it is happening at a time when high performance, low-cost receivers are stacking up on street corners all over America in abundant supply. From the earliest Washburn and then Ramsey inspired 'Sat-Tec' (or Ramsey Electronic) products, the benchmark from John Ramsey has been low cost and moderate performance. In recent years, faced with the ever stiffer off-shore competition, John Ramsey has found his original Sat-Tec line at a growing disadvantage when compared to Taiwan and Korean receivers which have themselves matured into good performing pieces of hardware. How long 'could a kid in the backwater of upstate New York' continue to compete with 'offshore labor rates'? **More important**, was not the offshore technology 'catching up' to Ramsey's legendary ability to strip out costs?

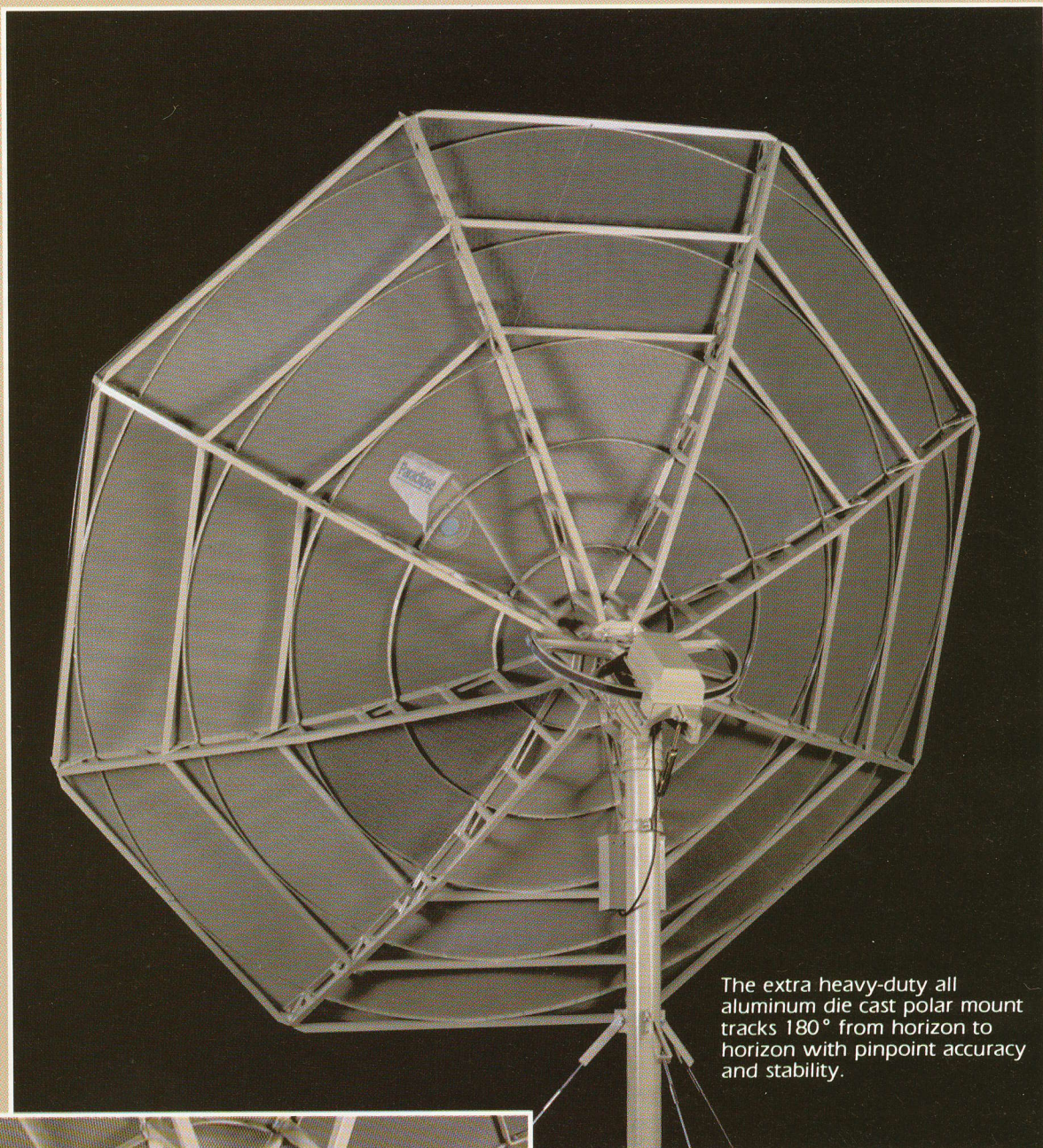


**HANDHELD REMOTE** provides channel toggling or direct-access by transponder number in addition to other tuning functions.

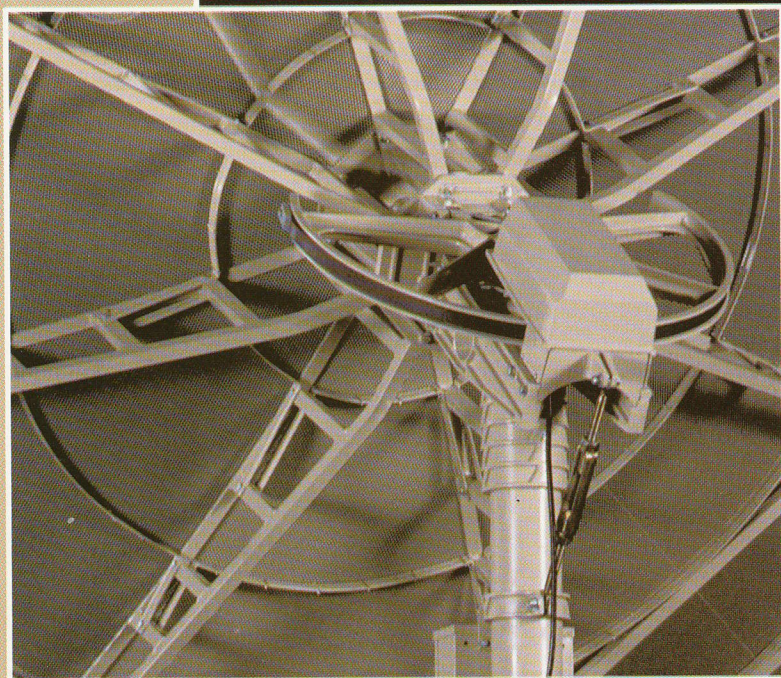
The ProStar receiver started out as a 'no holds barred' design. Trying to break out of the image of producing only low cost and cheap products, this receiver was to be John's best effort to date. Ramsey wanted it to be as automatic as possible, controlling everything from an IR handheld. He also wanted performance to be equal to the best. The project drifted along, Ramsey and staff designing, a well known Japanese firm interfacing for possible production, for more than a year. The marketplace, meanwhile, was anything but static. Each time the design appeared 'frozen' along came a new receiver with a new feature which Ramsey felt obliged to consider for possible inclusion into the receiver. As the 'features rose' the projected cost also rose and finally it became apparent that this was a treadmill that continued into infinity. You could keep on adding features, and incremental cost increases, forever. You would also never get into production if you followed this scenario to its logical end.



# Parclipse CD



The extra heavy-duty all aluminum die cast polar mount tracks 180° from horizon to horizon with pinpoint accuracy and stability.



**RIGIDITY** For an antenna to produce a sharp, clean picture it has to maintain a very high degree of parabolic symmetry. The structural integrity of any antenna design will greatly influence its gain and beamwidth characteristics. Strength is critical for good performance.

**ACCURACY** In addition to a perfectly shaped reflector, you must be able to aim the antenna with predictable, repeatable precision. A stable, accurate polar mount and drive system will enable you to enjoy truly care-free operation of your system.

**ENDURANCE** You'll want an antenna system that performs without excuses. You'll want that same performance tomorrow as well as years from tomorrow. Start with a high performance Parclipse system and that's what you'll get.

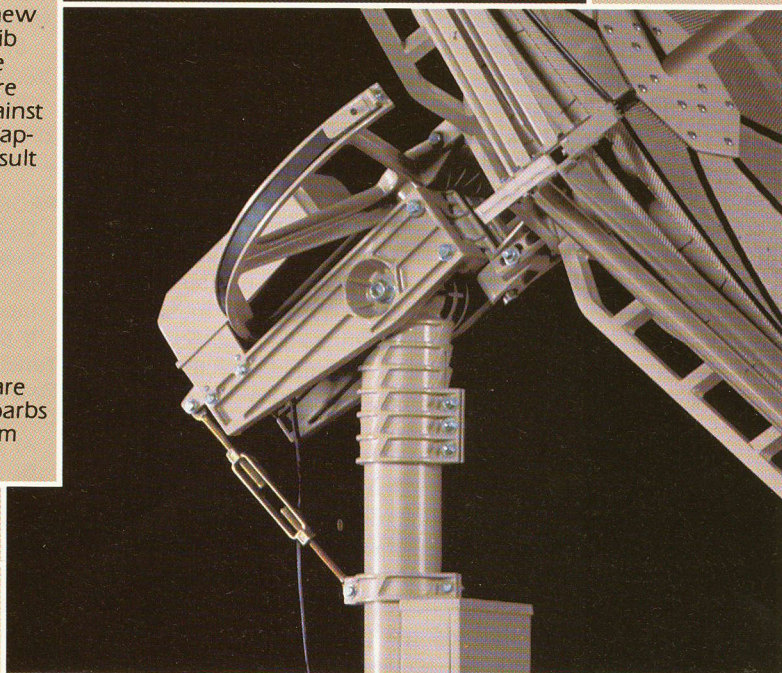
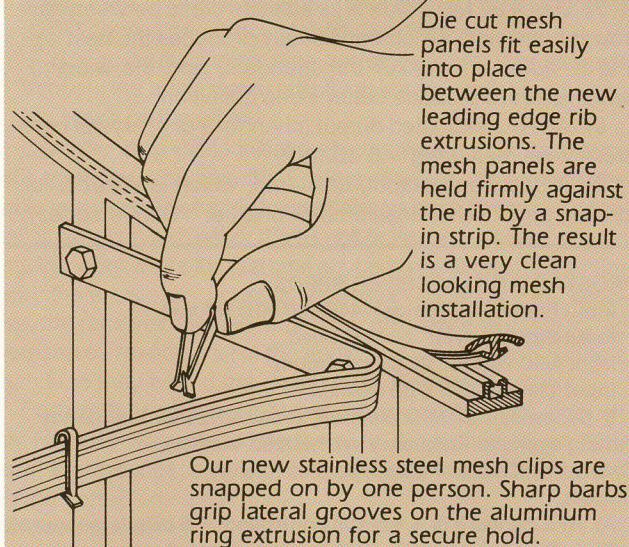


Our guyed feed system is perfectly tuned to fully illuminate the reflector and to optimize the satellite signals. It is the strongest and most accurate system available.

Our new **Cog Drive** system eliminates most of the service problems you get with a linear actuator. No more slop in the azimuth control. No more worn out acme nuts. No more motors full of water.

# Paracclipse<sup>TM</sup> CD

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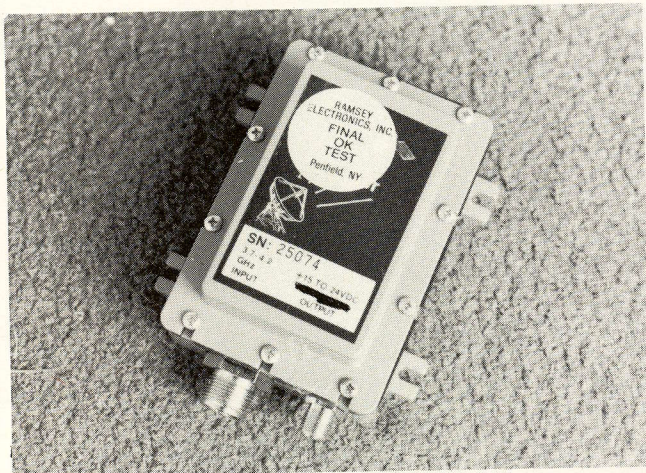
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AVANTEK built BDC

Ramsey and marketing advisor **Dave Fedric** had a target price in mind; under \$350 dealer cost. Fedric believed that if the receiver had all of the features of the \$700 range units, but cost approximately half as much, he could move all that Ramsey could produce through the Japanese connection. But most of all, **the receiver had to work well.**

Ramsey's past design efforts have usually followed a 'cost-first', 'performance-second' philosophy. Both Fedric and Ramsey were adamant that the ProStar would reverse that sequence; 'performance-first, cost-second'. When the first shipment of receivers arrived in the United States in mid-summer, there were problems.

The ProStar unit breaks no real new ground in the way of clever, new **technology**; that is probably a plus since 'new technology' has a way of chasing its designers around the production floor for several thousand units until the designers get the beast tamed. This is a block downconversion package which has chosen the 440-940 MHz range for IF. In Ramsey's view, the trade-off of a lower IF (ie. rather than the 950-1450 MHz IF range which seems to be a defacto **Japanese-brand** standard) is an important consideration for the installer who wants to gang up multiple receivers without having to find customized distribution parts. The downside of having chosen the lower range (400/900, 440/940) region as the IF is that the installer has to be bright enough to **select** component parts (splitters, taps, connectors, amplifiers) which will, in fact, function over the **full** frequency range. As **CSD** has belabored in several prior issues (see **CSD** for **May 01, 1985** for most recent discussion), many of the UHF-TV range devices required for distribution do not always function adequately in the top-end (high frequency end) of this frequency range.

What separates this particular BDC receiver package from others in the 400/900 MHz (nominal) region is the infrared remote control features and the price of a nearly-full function remote. For a price under \$350, the installer is able to offer the customer across-the-room channel selection, fine tuning, audio tuning, audio format selection and direct channel access. Dish movement is controlled separately, however.



RAMSEY XR-1 BDC works but not as well as AvanteK unit.

#### The Receiver:

- 1) Is quartz reference tuned, making channel selection very positive;
- 2) Can be fine-tuned, in spite of the quartz tuning, to allow a measure of 'stepping around' local TI carriers;
- 3) Provides mono audio, matrix, stereo audio and discrete stereo audio with remote controlled audio tuning over the 5.5 to 8.0 MHz range;
- 4) Automatic polarity switching (Polarotor 1) with skew control;
- 5) Automatic changeover to the terrestrial TV antenna/cable connection (by shutting off ProStar receiver);
- 6) LED display for channel tuned, LED bar graph for signal level and audio tuning
- 7) Has a 27 MHz wide IF, a suitable cross between narrower bandwidth which traditionally produces the best signal to noise on weaker transponders, and the wider IF which **should** produce better video definition;
- 8) An RF modulated output (channel 3 or 4, crystal controlled; we measured +6 dBmV);
- 9) A baseband output, unfiltered, which is suitable for driving an external descrambler unit (ie. VC2000 series);

#### PROSTAR (XR-1) RECEIVER SPECS:

**Input Frequency Range:** 440/940 MHz (block)

**Input Signal Level:** Not specified

**Input AGC Range:** 20 dB minimum

**Input Threshold:** 8 dB claimed

**IF Bandwidth:** 27 MHz claimed, at 300 MHz PLL Frequency

**Tuning system:** Frequency synthesized, memory

**Polarization Control:** Pulse type (Polarotor 1)

**Outputs:**

A) RF/Channel 3 or 4, **crystal controlled**, +6 dBmV measured

B) **Left and right audio (Matrix, discrete) and mono audio**

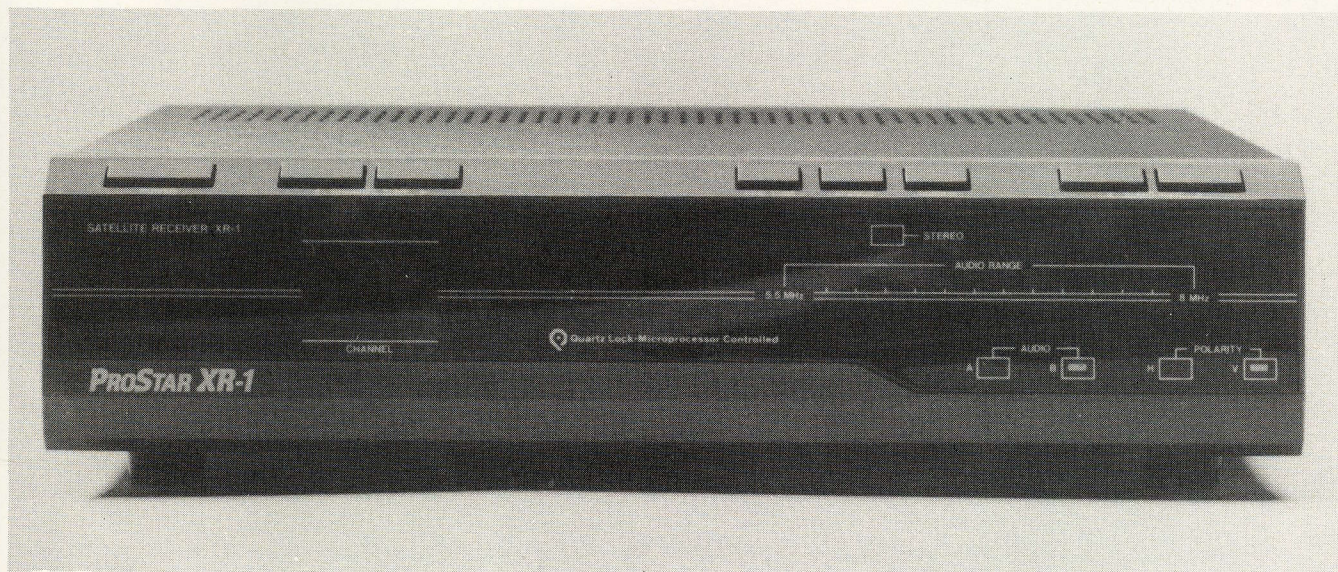
C) **Baseband, filtered video** 1 volt peak to peak

**Control:** On board soft-touch controls or IR remote

**Price:** \$319 to \$349 dealer net through distributors, less BDC (BDC available at \$49 or \$59, see text)

**Source:** ProStar Microwave, Inc., 2575 Baird Road, Penfield, NY 14526 716/381-7265.





PROSTAR XR1 is compact (11-3/4" × 3-1/4" × 10") and lightweight (7 pounds).

and

10) Baseband audio output, right and left, at 'line level' (typically 0 dbm).

Internally, there is a demodulator circuit which is quite unique, a 300 MHz frequency range PLL circuit which Ramsey developed as a solution to bandwidth limitation problems usually encountered with PLL devices at the more common 70 (or 134) MHz region(s).

The initial units provided to distributors for test suffered two serious problems:

1) The downconverter provided, a DC-XR1 unit from Ramsey, simply did not perform adequately. Output was lower than it should be and there was an erratic type of (DRO driven) frequency stability problem.

2) The audio tuning was not smooth. As you stepped through, the audio would roll off too sharply on 'one side' and too slowly on the other.

Compounding these initial problems was a third problem, with memory. You see, the ProStar receiver 'remembers' the audio and video fine tuning instructions for each channel. The installer sets it up with either the IR unit or the on-receiver controls and, in theory, that's the last time anybody has to touch either unless there is an unusual downlink situation. In practice, the receiver failed to remember properly and users found themselves resetting all of the audio and video tuning controls each time they turned the receiver on. **Not good.**

Fortunately, these problems were caught early enough that Ramsey was able to interface with the manufacturer (Mitsumi Electronics; a very sizeable Japanese firm) to have the design corrected.

#### PERformance

CSD received one of the first 100 units, for evaluation. We discovered what other early testers also found; the problems just reported. Our feedback to Ramsey was cryptic and pointed. Neither was necessary, it would turn out, because Ramsey was already Japan-bound on a trans-Pacific shuttle to sit down with Mitsumi and correct the problems. Some were

'software' related; smart chips within the receiver were simply not smart enough, or their 'logic' had become 'twisted' during production. The channel tuning and audio tuning problems were quickly corrected and for those first few hundred units out in the field, chip-set changeouts could correct the tuning problems.

The downconverter problem was resolved in two ways:

1) The original plan was for a Japanese built LNB for the package; a completely integrated package which would allow the installer to attach a feed, run a single cable, and be 'in business' at the receiver end. Delivery of the LNB portion of the receiver was delayed. The XR-1 BDC, which has to be retrofitted with an LNA of dealer selection, was an interim approach which offered the dealer a second option to building a ProStar system; he could use the BDC and hand select an LNA which suited his localized reception conditions.

Stability, and output level of the XR-1, had to be readdressed. While this was going on, the ProStar receivers were piling up at the Ramsey dock. The solution was to go to Avantek for their recently announced BDC unit. This may have been a blessing in disguise, since the Avantek unit performs exceptionally well for relatively few dollars.

2) At the present time the dealers have two ways to go; they can opt for the redesigned XR-1 from Ramsey directly, or through Ramsey an Avantek BDC which mates with the 440-940 MHz IF range. There is a small price differential (\$10) with the Avantek unit.

When we received a second unit late in September, our first 'test' was to place it along side the original unit for comparison. There was very little comparison between the two: the video and audio were significantly improved on the current version package (using the Avantek BDC). We also tried the older XR-1 BDC (produced before the stability and output problems were properly resolved) with the latest version of the



# MAXUM<sup>TM</sup>

008

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## SINGLE AND BLOCK CONVERSION

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# MAXUM™

RC-011S

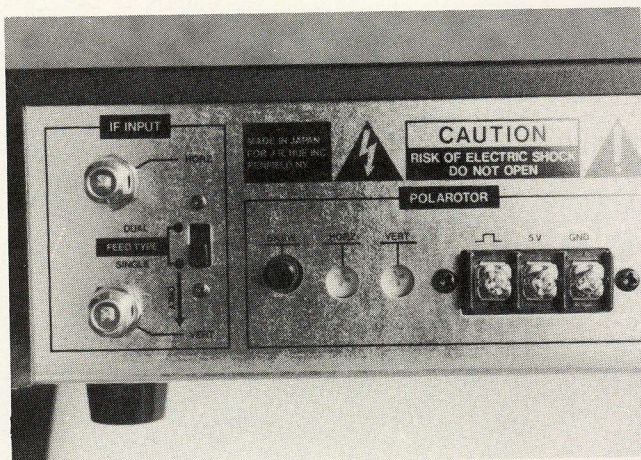
a good deal  
more  
for a good deal  
less



SINGLE AND BLOCK  
CONVERSION

MANUFACTURED BY WESTERN SATELLITE





**USER CAN** use polarization switching unit or twin LNAs with dual-pole feed (left); fine tune of polarization is provided.

receiver, performance was improved from the original package here as well, although it was obvious that the Avantek downconverter was a generation-improvement from the older original, XR-1 downconverter.

There are these specific observations:

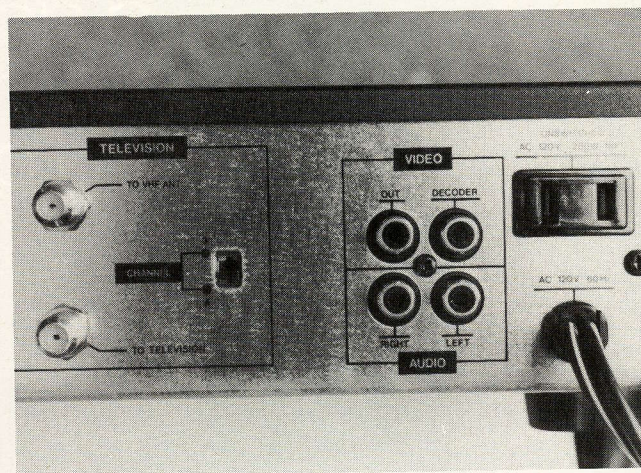
A) The ProStar receiver has an interesting 'threshold effect.' When you hit the receiver with a **healthy signal** (in the 9 dB and up carrier to noise region), **the pictures** (and audio) **are superb**. The 300 MHz region PLL appears to have a very sharp 'threshold knee'; that is, when it really starts cooking, it does so very abruptly.

The linear nature of the PLL produces video at good carrier to noise levels (9 dB and up is a 'safe' number) which comes close to what one sees from a true high definition receiver such as the USS/Maspro SR-3. It is **better video** than one expects from a 27 MHz wide IF and there are certainly some 'tricks' in here which Ramsey has learned well.

B) The downside is that when you drop a couple of dB below threshold (6.5 to 7.5 dB would be a 'safe number' here) the video and audio come apart quite rapidly. The audio on the first version of the receiver failed first, but on the current version the two fall off at about the same rate.

The message here is that for the dealer price range of this receiver, you can expect better pictures (and suitable, if not outstanding audio) from the ProStar than you will see from receivers costing at least twice as much, provided you are above threshold. **Our recommendation to dealers**, therefore, is that you should try a ProStar unit for possible resale. You should try it with the intention of using it in systems where the customer is **not trying to squeak by** with a six foot dish when an 8 foot is recommended or with an 8 foot when a 10 foot is recommended. **This receiver works far better than its price suggests**, but only if you use it properly.

In the past, Ramsey designed receivers (ie. Sat-Tec) have often 'packaged' with antenna and LNA combinations which end up being 'dealer price leaders.' In effect, the dealer



**REAR DECK** connectors include TV antenna input (switching automatic), baseband (filtered) and decoder (unfiltered) outputs.

knows he can buy a Sat-Tech product 'right' and by combining it with antenna and LNA pieces which he also 'buys right', the consumer is presented with a system-package which he will usually move away from (ie. go upward in system quality) if he has the dollars to spend. That's a legitimate function for a low cost product line. The dealer who approaches the ProStar with the same attitude (believing before he turns it on that he has another 'low end price leader') and who connects it to the smallest sized dish he has for sale will get, as we found out, less than satisfactory results (the **Anderson BDC** package, for example, while not offering the same user convenience, has significantly better pictures **below threshold**). That's the wrong dealer attitude towards the ProStar. It should be considered as a part of a system package with at least the mid-range antennas (8 foot if you sell 6, 8 and 10) and even as a lower priced receiver option for the top (largest) size antenna package. Again, **the video is superb** if you produce a carrier to noise ratio which 'tickles' the 300 MHz PLL properly.

#### BUYING The ProStar

The receiver is currently selling to dealers, complete with the IR remote, in the \$319 to \$349 region at approximately 30 distributors nationwide. To this the dealer must make an optional selection between the XR-1 BDC downconverter (\$49 typically) or the Avantek downconverter (\$59 typically). Remember that this is a true BDC system and you can stack multiple receivers to the system using mini-cable wiring techniques which have been detailed in CSD previously.

Down the road will be the ProStar LNB package which, when available, will give the dealer another option of how to get his 3.7 to 4.2 GHz signal down to the 440/940 MHz interface of the receiver IF proper.

The features here are significant, although hardly unique. The performance, given the conditions recited here, is excellent and dealers who are looking for a price break-through with IR controlled stackable receivers would do well to look at the ProStar unit.



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#### **T & T Satellite**

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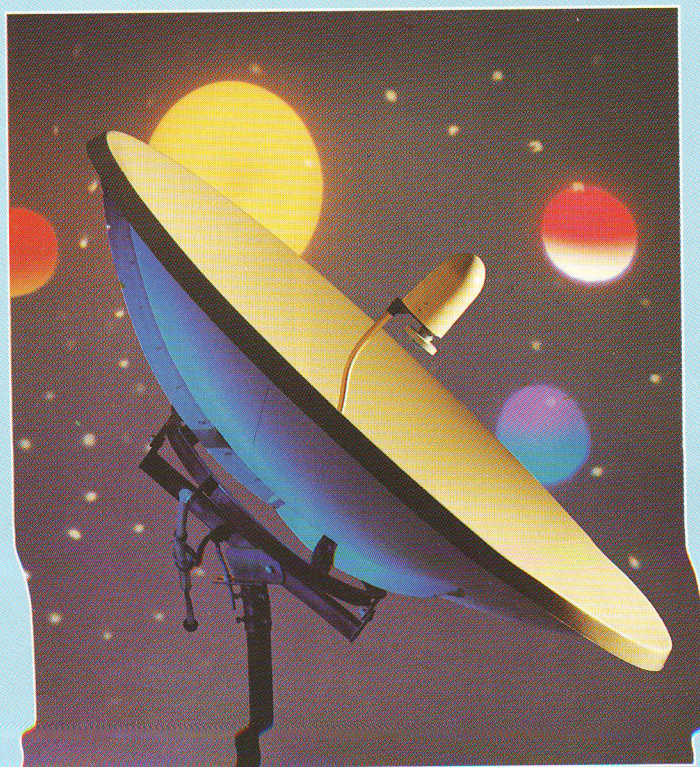
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DAVID OWEN-THE ATLANTIC (MONTHLY) JUNE 1985.

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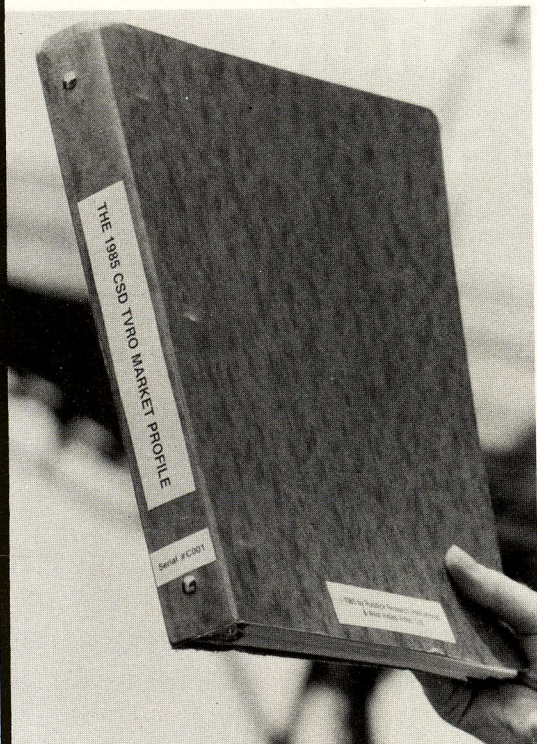
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**METHODOLOGY/** Nearly 5,000 home TVRO system users were identified through an arrangement with a cross-section of TVRO hardware original equipment suppliers. A random sample of warranty registration card files provided a master 'survey universe' covering the period 1980 through 1985, spread over all regions of the United States and outside the USA where DOMSAT (domestic US satellites) can be received. Survey results are based upon 2,086 responses (43.6%) received by the specified cut-off date. The study was conducted under contract by Ruddick Research International.

**Partial listing of questions included in original survey form:** How long had satellite earth station? **Region of country?** Primary use of system? **Factor that convinced you to buy system?** Number of broadcast television stations you receive? **Currently have access to cable TV system?** A subscriber to the system? **Pleased with cable service receive(d)?** Total number of hours per week satellite system used by all members of household? **Satisfaction with satellite receiving equipment?** Satellites tuned-in three or more times per week? **Category of programming viewed most frequently by household on satellite?** Categories of programming viewed next-most frequently? **Important source of satellite programming information?** Main benefit expected from satellite equipment? **How much spent on satellite receiving equipment?** Other electronic equipment currently have or own in home? **Live in incorporated city or town?** Population of city or town? **How far from residence to nearest city of 100,000 population or more?** Anticipate replacing or adding satellite receiving equipment within next 12 months? **Equipment plan on buying?** Age of head of household? **Family status of household?** Income of household? **Education of head of household?** Occupation of head of household? **Publications subscribed to or read regularly?** Programming sources viewed through satellite: **ABC, CBS, NBC, WTBS, WGN, USA Network, CBN, ESPN, HBO, Cinemax, Showtime.** Type of products usually purchased? **Buy sooner if on credit?** Generally a 'risk taker' in purchasing? **When shopping, generally buy more than anticipated?** Use 800-toll-free numbers when shopping? **Tend to buy merchandise based upon lowest pricing?** Consult literature and publications for education before buying? **Generally compare prices before buying?**

**Partial contents of '1985 (CSD) TVRO Market Profile':** **Market Characteristics/** Location of residence in cities-towns; Age of head of household; Family income levels; Family status of household; Location of residence by region; Educational level of head of household; Occupation of head of household; Magazines subscribed to or read regularly. **Behavioral Segmentation Profiles/** Urban novelty seeker, Impulsive credit buyer, High-tech innovators, costly system owner, upscale low-end user. **Purchase Dynamics/** Length of ownership; Factors in purchasing decision; Number of broadcast stations able to receive prior to TVRO; Major benefit expectations; Cable TV access-subscription-satisfaction; Electronic equipment cross-ownership; TVRO system upgrade potential (age of system, cable access-subscription-satisfaction, equipment cross-ownership). **Usage Patterns/** Viewership; Satisfaction; Satellites viewed; Types of programming viewed; Services viewed (Viewership, Programming viewed).

## HOW TO ORDER:

### 'The 1985 (CSD) TVRO Market Profile'

**PLEASE enter our order** for a single copy of the 150 page '1985 (CSD) TVRO Market Profile'. Our check for \$1,000, to West Indies Video, Ltd., is attached. We understand that this 'Profile' is being sold to us with our agreement that no portions may be duplicated for distribution nor published without the written consent of the copyright holders. We also understand that our copy will be sent via Federal Express within two working days of receipt of our order and payment.

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# THE BIG BLACK BOOK THAT UNLOCKS THE SECRETS OF THE TVRO MARKETPLACE



- WHO —** really makes up the 1985 TVRO marketplace? Is the marketplace shifting from rural to suburban?
- WHAT —** motivates people to buy TVRO? Movies, sports, news??? How important to TVRO owners are the **unscrambled** network TV signals?

**NOW** for the first time there is a 'definitive profile' of the TVRO marketplace; a detailed, perceptive look at the demographics of the TVRO consumer, complete with behavioral segmentation profiles! More than 2,000 present-day owners of TVRO completed a 43 question, four-page survey designed by skilled marketing strategists to elicit data which would allow a full computer tabulation of the 'demographics of TVRO.'

**THE 1985 (CSD) TVRO Market Profile** contains 150 pages of charts, analysis, tables and summaries. 'The Profile' provides insight into the motivations of TVRO purchase and reveals important 'user satisfaction' and TVRO system 'use profiles' for the first time. 'The Profile' is skillfully edited and arranged into sections to allow cursory, intermediate and in-depth analysis of all of the important factors influencing TVRO purchase and use.

**Within the 150 pages** there are 32 'basic tables', 49 'cross-tabulation tables' and 38 'behavioral tendency tables'. A 16 page 'Executive Summary' backed up by 22 pages of 'summary tables' is tailored for the busy management person who needs to understand the basic motivations of TVRO but who does not have the time to prepare his own analysis.

**'The 1985 (CSD) TVRO Market Profile'** is available to you on a confidential basis for use limited to within your organization, and it may not be reproduced nor printed in any form without the written consent of the copyright holders.



## ROOTS OF TVRO/ (PART 17)

**This series** Re-visits the history of terrestrial/broadcast television, from the perspective of the 70's "ultimate technology," cable TV. This series first appeared in **CATJ** magazine in 1975, and its publication forced many changes in FCC policy vis-a-vis cable TV.

### SO TO TODAY...

*Millions of American homes are today, even with translators, with boosters, with cable, and with the primary broadcast stations and their satellite stations, without adequate television reception.*

So what is adequate television? One channel? Three channels? Five channels?

Competition for viewers is the creed of the broadcasters. The FCC has set the pattern for networks: there shall not be more than three, if the FCC has anything to say about it. Their handling of the allocations mess has seen to that.

So it is basic that if there are three national networks, that *any definition of adequate* or minimum service levels to all American homes must include reception from stations which provide real-time (i.e. simultaneous) choice of network programming from all three networks. Right away we have three in our number-pot.

Former FCC Commissioner Frieda Hennock wanted to reserve 25% of all television allocations (i.e. channels) for educational use; in the final analysis, less than 15% went to the educators, but even that number strongly sug-

gests that *every home should have access to no less than one educational (i.e. public broadcast) outlet*. So now we have four in our number-pot.

And here is where we run into trouble: the more-than-four syndrome. Large market centers, such as Los Angeles and New York, have multiple outlets of non-network signals available. Had the FCC not set out *almost* deliberately to put the DuMont Network out of business by not providing channels for its affiliations in the same markets that CBS and NBC had affiliates, the basic service or adequate service criteria would have been four plus one (one being ETV) rather than three plus one. So virtually everyone, the FCC included, accepts that *at least one non-network affiliated station* is permissible.

What bothers CATV people the most is why the FCC should have the self-given authority to decide that CATV viewers in Pocahontas, Ar., are entitled to view, via cable, only three network signals, one ETV signal, and one independent (non-network) signal; while home viewers with rooftop antennas near Pocahontas are free to watch up to ten television stations by simply installing a \$100 antenna on their roof and connecting it to their





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receiver. The FCC claims that to allow cable viewers in Pocahontas to receive more than five stations *might* severely cripple the continued television broadcasting of a station located 31 miles from Pocahontas, in Jonesboro. Pocahontas is singled out *here* not because it alone could (the FCC claims) cripple the economic well-being of the Jonesboro station, but because the cumulative effect of people within the Jonesboro station's service area watching too many television stations might (the FCC contends) be injurious to the economic health of the Jonesboro station. We'll explore that line of FCC reasoning, which plays right into the think-tank of the broadcasters and the networks, a little later on.

So anything more than five separate stations on a cable system is taboo for many CATV systems (others are "allowed" up to seven signals, made up of three network signals, one ETV/PBS signal and up to three non-network signals). The rationale behind this is unclear at best, as we shall see.

But what about the people in the country who would do cart-wheel flips for five stations? How many are there, like this?

The FCC, and the networks, would lead you to believe that these are insignificant numbers. Another government office would lead you to believe otherwise, *and CATJ agrees with the latter.*

Anytime someone suggests that the FCC's mandated TV allocations table is *not* doing its job, the FCC promptly rushes out a *counter* statement. That usually ends the matter, *for the time being, because to date no Congressional office or committee has taken the time to seek out the truth.* Hopefully, a forum will be created in the near fu-

ture, at which time the FCC will be asked to *prove* that its allocations table is bringing television to the rural areas.

For the time being, let's make reference to a study, accompanied by a report and a recommendation, released by the *Office of Telecommunications Policy*, in mid-February of this year.

A couple of years back, when now Acting Director of OTP, John Eger, was being questioned for confirmation to his present post by United States Senator Howard Baker of Tennessee, Eger explained to the Senator how he wanted to develop an OTP study to pinpoint those areas of the United States where inadequate television service existed. Subsequently OTP embarked on a study by commissioning the prestigious *Denver Research Institute* to look into the matter. DRI undertook first to determine, in phase one of their study, those areas of the country which presently receive (1) *no* television reception, from any stations; (2) those areas of the country who receive *fewer than three* channels of television, and, (3) those areas of the country which receive fewer than five channels of television. The DRI study made *no* attempt to separate those areas receiving say three channels by whether the three channels were of different base network affiliations, or whether (as does occur in some areas) *all three stations* are affiliated with the *same network*. Obviously receiving three stations is of *little* benefit if all are say NBC affiliates, since *three channels carrying the same program* at the same time hardly contributes to viewer program selection diversity.

The DRI study, phase one, set out to measure coverage nonetheless, and it found that:



- (A) Approximately 1,000,000 households, or 1½% of all U.S. homes, are out of reach of any television stations (including ETV stations);
- (B) Approximately 6,000,000 households, or 9% of all U.S. homes, are presently out of reach of three television stations (i.e. 6,000,000 homes do NOT receive three channels);
- (C) Approximately 22,000,000 households, or 34.1% of all U.S. homes, do not receive five television stations.

Thus by the study commissioned by the President's Office of Telecommunications Policy, fully a third (+) of all U.S. households, today, *more than 23 years after the FCC lifted the so-called allocations freeze in 1952*, still do not have adequate (five channel or more) television coverage. The FCC may seek to deny these numbers, but they are, we believe, accurate nonetheless. The FCC's record is bad enough *without* their denial of this apparent basic truth.

As noted earlier, the DRI study dealt with the simple coverage of television station signals. For example, if you live in large portions of Cameron, Elk, Forest, and Potter counties in Pennsylvania (*yes—Pennsylvania!*), you are within reach of *one* television station *only*; that station is WPSX, a channel 3 educational television station. *You are outside of the direct* (i.e. unaided by cable) *reach of any other stations*. In the DRI study, the residents of these counties would be accorded "reception of one channel" and thus would *not* contribute to the figures for *that segment* of the population which receives *no* signals. Yet if *you* lived in these county areas in north-central Pennsylvania (such as in Wilcox, on Highway 219 north of Johnsonburg), you would hardly agree with

DRI according you *one-station* status. We have *not* cherry-picked north-central Pennsylvania as an *isolated* example; there are *literally hundreds* of such examples all across the United States, just waiting for the proper *Congressional forum* to be clearly presented.

So DRI says:

- (1) 1½% of U.S. households do not receive one channel;
- (2) 9% of U.S. households do not receive three channels;
- (3) 34.1% of U.S. households do not receive five channels.

To which CATJ can only add that *our own research* suggests that the numbers can easily be *several times as large* in the one-channel and three-channel categories, as perhaps as much as 40% of U.S. households in the five-channel category when you use *as your criteria for measurement* not the physical number of channels received, *but the number of different program services received*. Again, receiving two channels is not very important if both are NBC affiliates and the dual reception offers no more program selection than you would have with a single channel of reception.

Still, the DRI study and the presentation by OTP is a forceful *first* step in the right direction. In mid-February, the Acting Director of the Office of Telecommunications Policy (OTP) sent the reports from DRI along to the office of FCC Chairman Richard E. Wiley with a recommendation. OTP urged the FCC to:

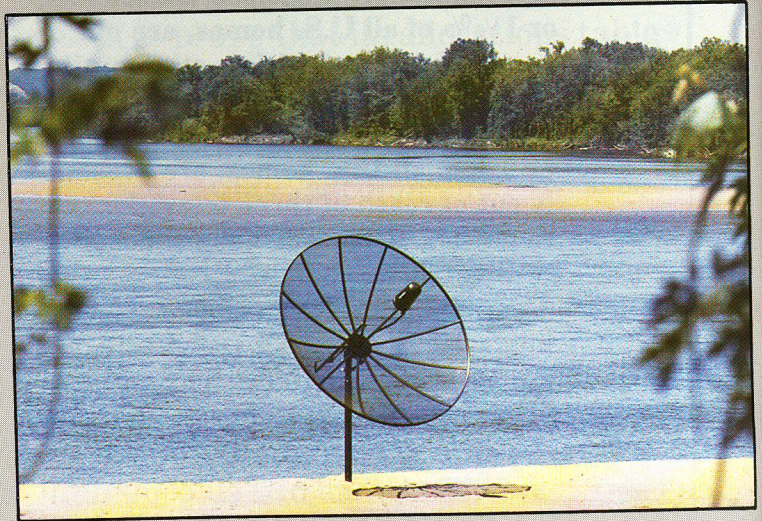
- (1) **Attempt to develop a hybrid plan that would allow CATV systems operating (now or in the future) in those areas which DRI identified as underserved to provide a combination service to both the local community (i.e. Wilcox,**



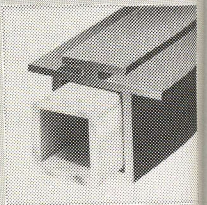
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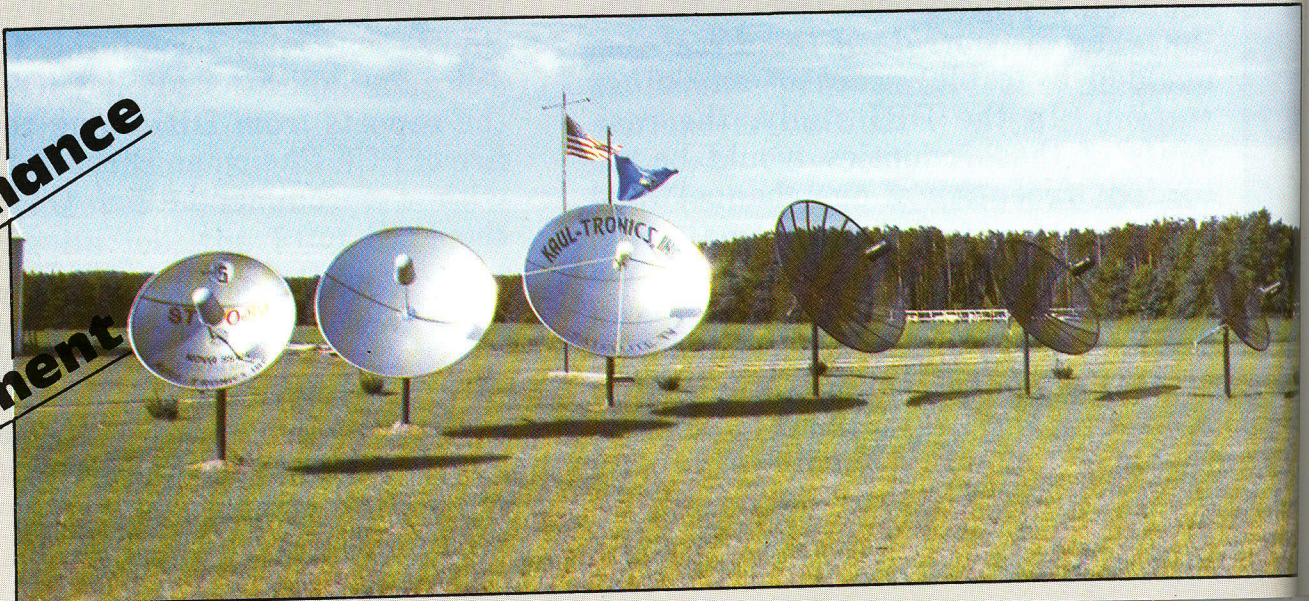
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Pa.) and to the surrounding countryside (i.e. a radius of perhaps 10 miles of Wilcox, in northern Elk County, Pa.);

- (2) Modify existing FCC rules which "prohibit CATV operators from owning and operating translators" in the same area as their cable systems, so that through a combination of equipment and personnel the cable operator could serve not only the town with cable but the rural areas as well with translators.

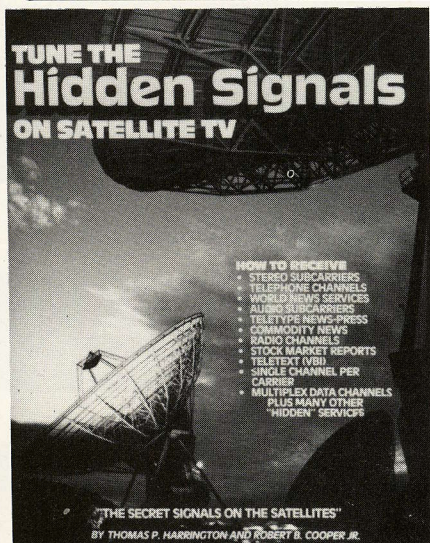
Under the present scheme of things, the FCC allows everyone *but* cable systems to own and operate translators. This includes radio and television broadcast stations, local non-profit groups, local tax districts, local for-profit translator companies, local city and county governments. . . . *everyone BUT cable system operators.* This strange prohibition developed during the late 50's and 60's when the Com-

mission was attempting to stop cable *by whatever means it could*, and they justified this divorce of cable and translators at the time by trumping up the *story* that cable and translators were competitive mediums. Interestingly, the possibility that the two might be competition has never seriously impaired the Commission's granting of TV licenses to local newspaper publishers, or to local radio station operators, or to local newspaper publishers *and* radio station operations who *also* wanted a piece of the local television picture. *Apparently the FCC has only been concerned about small, little, local concentrations of media; never large, regional concentrations of media.*

The DRI/OTP report, *now* in the hands of the FCC, *will never amount to much* unless Congress shows a keen interest in the FCC's handling of tele-

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Viewstar comes equipped with stereo audio, and with frequency synthesized tuning which eliminates distortion and drifting. Plus, with the remote unit you can conveniently control the audio volume and mute.

## Easy on the pocketbook.

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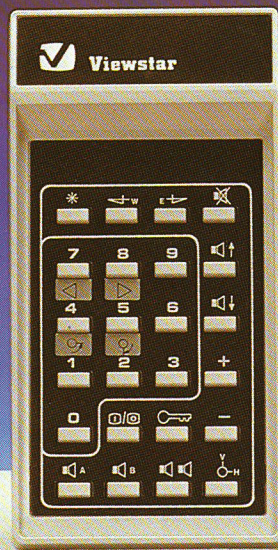
## The decision is easy.

Viewstar's VSS 1450 receiver is the one to choose for superb satellite viewing at the touch of a finger. Sit back and enjoy the easy life with Viewstar.

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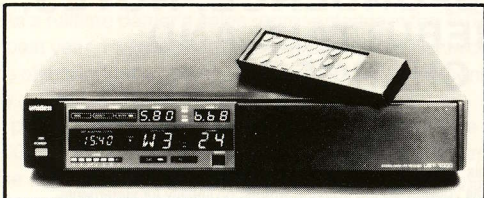
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**UST 5000** Block receiver offers LED channel display, automatic polarity control, slow and fast scan.



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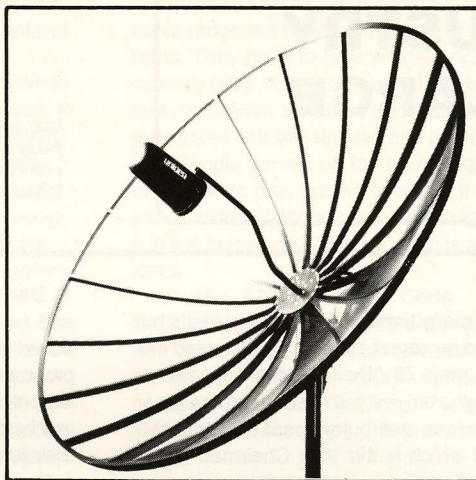
**UST 7000** Block receiver features IR remote built-in programmable antenna control accommodating up to 81 satellite positions in memory.



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vision allocations. The FCC has shown, repeatedly, that it is better at foot dragging and proposal burying than virtually any other federal agency. The powerful, well-entrenched broadcasters will *not* like the OTP proposal that 22,000,000 U.S. households should have a *minimum* of five channels of television service; and as long as *they* do not like it, the exceedingly biased FCC, *taking its direction from the pow-*

*erful broadcasters* and their lobby, will *never* show the initiative to improve the lot of 22,000,000 American families now receiving inadequate television reception. And that is hardly limited to the present OTP proposal, whatever its value. That is an across-the-board indictment of the FCC, to ever do anything that the present broadcast media does not wish done.

## INDUSTRY AT LARGE

## CORRESPONDENCE, NOTES, REBUTTALS AND CHARGES . . .

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### Call Me First?

I have wanted to write to you many times in the past few years but never made the time to do so. (To my regret.) What has prompted this letter is your article in CSD/6-85, page 78, "Built-In Hostility." I am not only surprised, but amazed that you did not call me or the three other Indiana SPACE board members (one distributor board member, two dealer board members), one of which is the Vice Chairman of the dealer board as your article stated.

I have been in the TV/CB/Ham antenna business for 15 years; I started when I was 15 years old. Married at 17, LuAnne and I have been very proud of our reputation in the area (although my pride has been shaken a few times in the last five years). We have been licensed by the state of Indiana since 1972 as an antenna installer, and with MATV and Satellite endorsement since it became available last year. **Most satellite dealers did not know about the license requirements.** There was a lot of confusion coming from the Indiana Board of Radio & Service Examiners at that time as to what needed to be done to become licensed or to qualify to take the examination under the state's law; i.e. one year apprenticeship or qualified tech school. When told about the requirements, most satellite dealers chose to ignore them. This went on until last fall, when the IESA, working with the Indiana Board of Examiners, made a proposal which would require a satellite dealer/installer to obtain a Television & Radio repair license **before** he or she could install TVRO systems! This brought things to a head and SPACE to the scene.

To begin with, SPACE did not come to **my aid**; I came to the aid of SPACE. Derrick Humphries suggested that it would look very good to the Indiana Board if the satellite dealers would have a licensed satellite dealer represent them along with **Mike Schroeder**, of CSS, (one SPACE distributor board member). I volunteered for the good of the industry, and read the dealer statement that Brown & Finn had prepared for our position. Since then, our industry press has mistaken me for an unlicensed technician and a TVRO maverick.

**Derrick Humphries** did a fantastic job of representing our industry and made a very favorable impression of goodwill on the Indiana Board. We had promised at that time to put together an educational program later in the summer, designed to help the dealers with a satellite-only license exam. The Indiana Board was very appreciative of any help we could give them. The result of the meeting was to retract their first proposal and see what the certification program could turn out.

Your article stated that SPACE's position was that the Indiana State Board **must accept** the SPACE certification course as a replacement for the state license exam. We didn't say the Indiana State Board **must accept** the dealer certification program. We only **hoped the board would accept** the successful completion of SPACE's certification course, allowing the dealer to take the state's license exam in lieu of a first year apprenticeship.

As for the ETA/IESA (I am a member of IESA) sponsored seminar/training course in Greencastle, IN, I received more flack than I did from SPACE's certification courses. It seems the biggest complaint from dealers I talked with was that they paid for a Channel Master Rep to speak on parabolic design, and instead he talked for three hours on why dealers should buy Channel Master products!! Dealers called me to see if SPACE could get their money back from the IESA-sponsored courses they had attended. After I heard about the complaints and the low level of participating dealers that passed the test (which is very easy), I called SPACE and urged them to go ahead with SPACE's certification program — which we promised the state we would do anyway to help educate the dealer. Bob Luly, Brent Gale, and Bill Johnson were called in to help. With CSS, CVS, Hoosier Satellite, and Horizon Satellite as sponsors, the courses should get the certification program off to a good start here in Indiana.

The thing that I agree with most about your article is, 'Shoving out equipment at 100% of capacity regardless of who it might 'hurt' in the process.' Well, it has hurt us — and bad. I hope it's not terminal (with



112 IQ-160's in the field with no schematics, it ain't lookin' too good), but that's another story.

King D. Oberlin  
King's Antenna Service  
812 West Maumee  
Angola, Indiana 46703

**Our June (01) editorial 'comment' was carefully researched, since it was obvious we would be 'stepping on toes' no matter how we handled the topic. We appreciate your view and your report as a participant in the situation. It is clear that the Indiana TV dealers feel 'threatened' by the TVRO boom; if they can stop the sale or installation of TVROs by dealers who are springing up in vacant gas stations all over the state, they will try to do so. This is a fiercely competitive situation and each side has drawn blood. Regardless of how it really happened, the Indiana state TV people are going to do everything they can to protect the home turf. We may not agree with their motives or their tactics, but we must accept that in the State of Indiana, the testing program law 'is.' Until that law is changed, dealers must live with it.**

#### TO: SPACE Board of Directors

As a fulltime dealer's sales representative in the TVRO industry for the past year, I would like to express some comments on my observations of this industry from the salesman/prospective consumer point of view.

I personally feel that the main issue holding satellite sales down to 50-60,000 installations a month nationwide is the scrambling issue. It is the number one question asked by virtually all prospective TVRO owners. Often stated is: "I hear and read they are going to scramble..." This continues to remain a one sided issue in the public news media. No attempt is being made, either individually or in concert, by equipment manufacturers and/or SPACE to counter these news articles—obviously instigated by cable programmers and/or premium program producers, to discourage TVRO purchasers. As the efforts of SPACE in the legislative forum has proceeded to legitimize our existence, the cable and premium program industries continue their attacks on TVRO ownership through threats of \$400.00 descrambler(s) and excessively high monthly fees. It is time the TVRO industry, through SPACE, began countering these articles in the public news media. Let's create our own "news blitz" about what the premium program producers are going to have to do for millions of dish owners. The time has come to take these issues from the trade publications and place them before the public eye. Let's force the opposition to answer us in a public forum, where we can gain public support and thus more votes in Congress and more sales in the showroom. Only then are we going to dramatically improve what I feel is a poor sales showing of 50-60,000 units monthly nationwide.

As an example, I cite the enclosed article, which appeared in the **Atlantic City Press** on August 18, 1985, "Satellite-Dish Owners FACE New Rules." The Litchfield Group should contact this writer and counter the representations in this article with the facts and force the issues out into the public forum.

This I direct to manufacturers, specifically their apportionment of advertising dollars. Almost without exception (the exceptions being Uniden & Drake to my knowledge), manufacturers are not nationally advertising their satellite equipment to the general public. Little effort is being made to support their dealers in educating the public to the benefits of TVRO ownership. This, in my opinion, is a self defeating position and also makes me question how much faith these manufacturers have in the future of the industry. It is, after all, just another product to many of them. Our strength and viability as dealers is directly proportional to the support received from manufacturers; this alliance must include national advertising support. The time has come for those manufacturers who are committed to the growth of this industry to start spending their advertising dollars in educating the public to the ben-

efits of their product; we will do the rest—selling their product because theirs is the brand we will want to handle.

Thank you for your time in listening to my comments and I also would like to express my appreciation for all that SPACE has accomplished this past year.

L. Paul Janson  
Visalli Satellite Sales, Inc.  
Tuckahoe Rd.  
Vineland, N.J. 08360

**This letter was read aloud to the full SPACE Board in Nashville by Dealer Board member Anna Visalli. This sort of 'public hearing' of dealer concerns is an important link in the chain of communications between dealer and supplier. For the first time, as we reported in some depth in CSD/2 for September 15th, dealers have 'the attention' of OEMs and distributors. Keep it up!**

#### SCRAMBLING UNAMERICAN?

Should scrambling be outlawed as unfair, discriminatory, and anti-progress? The answer is yes, and for many reasons:

Americans are the only ones who paid their tax dollars to put communication satellites in orbit, and they are the only ones who are excluded from their free use. Americans are excluded because some live in areas with no cable services, and those who do have access to cable programs have no freedom of choice regarding available programs. They have to take whatever channels the cable company decides to offer. Americans are also excluded from the free use of their communication satellites because the rest of the world can decode scrambled satellite signals, and pay nothing to nobody, but the American people cannot do the same legally. Is that fair? Americans are only good to pay, but not to enjoy. If Mexicans, Cubans, Jamaicans, etc... can freely decode scrambled signals, why not those who paid for it in the first place? This situation is an insult to the majority of Americans.

In title 47 of the US Code "Telegraphs, Telephones, and Radiotelegraphs", Chapter 6, section 701, the Congress declares that **it is the policy of the United States** to establish a global TV communications satellite network which "will be responsive to public needs and national objectives..." **Is the cornering** of national satellite TV facilities by cable/programmers companies what Congress had in mind?

In paragraph (c) of the same section, it reads "...the corporation created under this chapter be so organized and operated as to maintain and strengthen competition in the provision of communications services to the public and be consistent with the Federal antitrust laws." Cable companies not only discriminate against people they cannot serve, but they set their rates freely, without competition (the only potential competitor being TVRO which is excluded by scrambling), and consequently form a trust prohibited by law.

In section 721 of the same chapter, it also says that the Federal Communications Commission "...shall insure effective competition." **Where is the competition?** The whole section emphasizes that everything should be done **"...in the public interest..."**. The present situation is everything but 'in the public interest'! Cable companies make their own selection of shows offered at exorbitant, self-fixed rates to a minority of Americans who can afford it. What about the other Americans? Programmers now have a potential monopoly through generalized scrambling. **Is it in the public interest?**

In the public interest, programmers should have scrambled their own non-commercial programs and not force commercial programmers to scramble. They could have ignored the TVRO phenomena. Instead they are waging war against TVRO owners, not realizing that the same TVRO owners can be a big asset for them should they go commercial instead of trying to kill such a superb new way of TV communications through scrambling and other ugly means. **The result of their decision is hostility** from TVRO owners who become more and



more aggravated, and could very well retaliate, putting an end to a programmer's business.

Congress must react swiftly and vote a law prohibiting discriminatory satellite TV transmissions and act in the spirit of the US Code. Satellite TV communications should be available not only to all Americans, but to the whole world, providing shows and commercials in at least five different languages (as in Europe), therefore boosting tremendously not only our overseas business, but our prestige as leader of the world.

Everyone knows how strong the impact of TV publicity and the related boost in our export trade could be more than enough to fill up our budget deficit. We must shape up and take the world market, which is now available to the first in possession of the technical advances and the commercial organizations necessary to face the tremendous demand for merchandise that will follow. **And we have the means to do just that!**

It is now possible to broadcast our signal, in at least five different languages, all around the world by means of a network of satellites spaced on the Clarke belt, retransmitting the uplink signal from one to the next and downlinking it to a portion of the earth below. New commercial programmers are badly needed to fill up such new programming needs. To encourage their establishment, a substantial tax break should be granted to these new programmers.

Our satellite TV communications should be open to all and not restricted to the benefit of few, as in the case of cable/programmers business. The FCC is now relocating the position of satellites in order to make more space available. Therefore, the use of such space for private business is acceptable no more since space is strictly limited. It cannot be extended and consequently must be kept available for general

eral public benefit only.

The people of the United States are slow to anger, but can be terribly vindictive when enough is enough. I am surprised that, so far, no one has thought of 'scrambling' scrambled signals. It would be so easy and inexpensive to do it by adding a pulsed little 6GHz oscillator at the focus of any dish aimed at their scrambled birds. **Of course**, such 'scrambling of scrambling' **can be illegal**, but this is a war, and as everyone knows, in war and in love nothing is prohibited! Such retaliative action will be practically impossible to spot on earth, and consequently unpunishable, especially if the scrambling of scrambled signals is made from different locations for a short period of time. I am convinced that no scrambling TV satellite programmer can stay in business with such a plague on his programs. He will be out of business in a matter of days. I will not recommend such type of action, **but it might be necessary**.

I urge our Congressmen to evaluate the present danger of generalized scrambling which, if put in practice by the majority of programmers (even those who have no need to scramble, such as commercial ones), will render useless the viewing rights legislation passed by Congress and signed by the President, destroy the TVRO industry, and make impossible the above described world trade. In the process, our nation will lose the enormous profit and wealth that comes with such trade. I hope Congress will stop the scramblers who are working against our nation's future and help new commercial programmers. If so, our satellite TV communications will be fair, nondiscriminatory and progress oriented.

Francois Moisdon  
4875 SW 28th Av.  
Fort Lauderdale, FL 33212

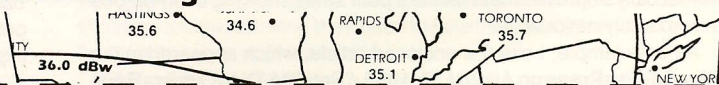
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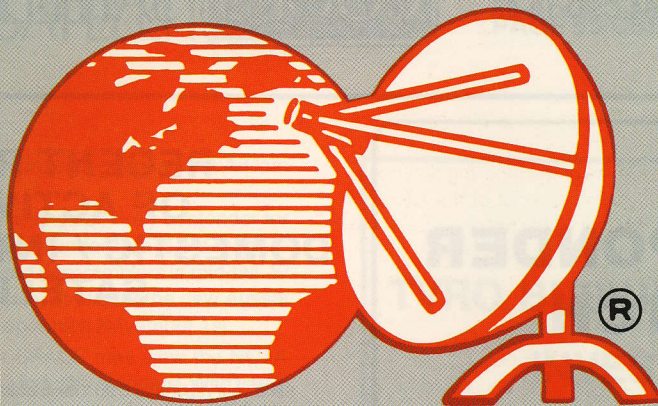
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**PANAMSAT**, one of three firms in private hands approved by FCC for international service, is buying a 24 channel (18 on C-band, 6 on Ku-band bird, originally scheduled by RCA Astro for American Satellite Company. The Bird will launch as early as July, but only after difficult Intelsat approvals still ahead. PanAmSat plans to service the Caribbean and Latin America, with useful footprints in the Florida and Gulf Coast areas, at 57 west.

**FORD** Aerospace approval for C plus Ku-band birds at 93 and 101 west is for birds with ten watts on C and 45 watts—plus on Ku. Ku-band coverage will be to 48 contiguous states (CONUS), while C band will cover these plus the Caribbean. 1989 is the projected launch date.

**WARC** meetings planning the future use of the Clarke Orbit Belt are coming down to the final days, at **CSD** deadline. Plans to expand the bandwidth of the 3.7 to 4.2 GHz downlink band (making it wider, and therefore making all existing equipment obsolete!) appear headed for approval, along with the stipulation that these expanded (new) frequencies will be 'reserved' on a nation by nation basis for third world, under developed countries. One possible side effect of WARC: USA may be agreeing to **not approve** any more private, international carriers, such as PanAmSat, as a 'compromise' for third world support. Many nations see FCC/US approval of private, international carriers/satellite operators as a 'threat' to long term success of Intelsat, upon which they depend for initial satellite links.

**INTELSAT** has created a 'spare transponder list' which shows more than 150 vacant transponders. Intelsat plans to offer these unused, spare transponders (C and Ku-band, 72 and 241 MHz wide) at new, lower prices with a revised set of rates that are certain to attract new users. One example proposal: for \$46,690 per month you may lease a 36 or 72 MHz wide C-band hemispheric or zone beam on a 7 year lease. At the present time, the lowest month to month rate from RCA is around \$66,667 per month for a 36 MHz wide transponder. RCA (et al) domestic transponders have far stronger boresight signals because of smaller boresight areas, but the trend to lower pricing is likely to cause US rates to come down.

**WITH** approximately 48% of all US domestic C-band transponders not in use, there are pressures to allow satellite owners to enter a 'free market' selling policy. At the present time, each satellite carrier must file his rates in advance with the FCC and await approval before selling transponder time. These 'tariffed rates' have the effect of limiting how cheaply satellite time can be sold. There is building pressure to end tariffed rates and to allow individual satellite owners to sell in a 'free market' environment.

**SINCLAIR**, UK producer of 'cheap electronics', may have suffered a setback in plans to offer super-cheap TVRO (12 GHz DBS) systems. The firm has planned financial backing of UK media chief Robert Maxwell. This support has been dropped and now Sinclair is looking for a replacement backer to cover the projected \$18M (US) that research and development will cost.

**SAMMONS** Communications and TCI, two of the largest cable MSO firms, have placed 'open ended' orders with M/A-Com for cable

style VC2 descramblers. The cable MSOs are 'betting' that the M/A-Com system becomes the defacto standard for cable scrambling. The MSO firms placed their orders in an effort to convince programmers who have not yet committed to M/A-Com that they should do so. Orders involve approximately 7,000 VC2 units, but are contingent upon programmers adopting the VC2 'standard'.

**OVERALL** size of US/Canada home TVRO marketplace for the 1985 calendar year may come in near the 550,000 terminal mark, when all of the units installed are added up. Best estimates for 1984 were just over 400,000, indicating that the industry's growth rate has slowed down significantly from prior years.

**OVERHEARD** at Nashville: "I have the solution to scrambling. It is obvious to me that owning and using a satellite system, with all of the available channels, is useless unless the user has a program guide. The solution to the scrambling issue is that we simply '**scramble all of the program guides**' and leave the programs themselves unscrambled!" (Sandy 'Gus' Wirth).

**G-STAR** Ku-band service went into operation 1 September, but the results are not good. Holiday Inn has taken five (half) transponders for transmission of Showtime, The Movie Channel, CNN, ESPN, and a special movie service. CNN and ESPN are on CONUS (national) coverage beams, while the remainder are on east coast half-CONUS beams. Reception from the CONUS beam channels is threshold-marginal on six foot dish systems (Hi-Net will be using **14 foot** antennas in their commercial configuration) and **below-threshold** in many areas. Half-Conus coverage is above threshold in east, far down in west.

**HOME SHOPPING NETWORK** has gone to 24 hours per day service on Satcom F3R, transponder 22. The shopping service is enjoying phenomenal success with discounted pricing and nearly 50% of all sales to date have been to home TVRO owners tuning in service (balance to cable homes served by the network).

**SPACE** Dealer Certification classes—by satellite, scrambled and for a classroom fee—will be back October 25, 25 and 27. Dealers may select from 'Satellite Antenna Installations', 'How to Market The Satellite Reception Service', and 'How To Start And Run A Small Business For Profit'. Details from SPACE at (703) 549-6990.

**SENATOR ALBERT GORE** agrees with SPACE and has urged dish owners to 'ignore CCN/ESPN/USA/MTV (et al) announcements that dish owners should send the programmers money'. Gore has introduced legislation into the US Senate to support home dish owners.

**SHOWTIME** and The Movie Channel, previously signed up for the M/A-Com Videocipher scrambling system, have notified M/A-Com **not** to begin shipping them descramblers. Showtime says that with the NCTA currently studying which scrambling system it will endorse as an 'industry standard', it would not be prudent to accept the M/A-Com units until a standard has been accepted. M/A-Com has known about the Showtime reluctance to move ahead with scrambling system installation for several months. With the NCTA in the process of evaluat-



ing potential systems and selecting an 'industry standard' M/A-Com expected this reaction from Showtime.

**SCIENTIFIC-ATLANTA**, meanwhile, another likely contender for choice as the cable industry's scrambling standard, says it is ready to begin shipping its B-MAC scramblers and descramblers in mid-fall. S/A is currently delivering B-MAC units to Australia for the new Aussat system, which is scheduled to go into operation November 1st.

'**BEST OF ALL WORLDS**' is how SPACE may view the NCTA selection of S/A B-MAC system as cable industry standard. With HBO/Cinemax already using M/A-Com Videocipher system, SPACE feels that acceptance of a different system as 'standard' by NCTA would help convince Congress that home TVRO industry faces an '**impossible Beta/VHS format**' situation. The threat of two (or more) systems in place, neither of which is genuinely ready to deal directly with the TVRO industry, increases the likelihood that Congress would adopt a proposed two-year moratorium on scrambling and mandate single scrambling technology for home TVRO.

**RCA** has completed the sales of its last available Ku-2 bird transponders. The Bird, with 16 available 45 watt channels, is scheduled for launch November 27 and will be heavily used by NBC and independent TV networks. AT&T, in a surprise move, took the last two available transponders though refusing to say what it plans to do with them.

**PAKISTAN** has set 1988 as launch date for the first of their domestic satellites, with 'extensive TV channel space' on board. The bird will be launched by Shuttle and will apparently include direct coverage of much of India as well.

The **GSA** General Services Administration arm of the US government wants to lease or rent out space for satellite antennas on top of GSA-operated buildings in major US cities. Lack of suitable antenna space within the core of major markets is causing problems among many satellite business system planners. Funds from the project would help GSA offset the huge annual losses sustained in the operation of federal buildings.

**SKY CHANNEL**, the WTBS-like, UK created, advertiser-supported cable network for Europe, has finally been granted permission to be cable-distributed within Belgium. Lack of coverage in this much-cabled European country has held back Sky Channel growth in recent months. The agreement, allowing the channel into Belgium, includes plans to develop French-speaking programming for the channel.

**NEWS** gathering transportable Ku-band uplinks are the latest darlings of American TV broadcasters. Dozens are now on order as stations scramble to be 'first in their market' to be equipped and ready for routine use of new RCA Ku-1 and Ku-2 birds, which will carry significant news/broadcast traffic by this time in 1986.

**CHINA** plans to launch the STW-2 satellite, an improved version of their present single channel C-band bird, in December or January. China plans to launch a Clarke-orbit weather satellite in the last half of 1987 as well.

**ITALIAN** private TV network promoter **Silvio Berlusconi** is reported to have invested \$10M (US) in the development of 'very low cost DBS receiving systems' for possible use in his plans to expand his 50 TV station terrestrial service to include all of Europe by 1988.

**CWD/ Conus Washington Direct** is a new daily news feed service on SBS-3 (Ku-band), placed into operation by Hubbard Broadcasting. The service will provide individual stations with late-breaking coverage direct from the nation's capital and will move to RCA Ku-2 when it is operational late in December.

**INDIA** expects to be able to launch its own Clarke-orbit satellite with Indian-built launch vehicles by 1990.

**HARRIS** got a contract valued at \$94M(US) to produce 320 encryption units for use by US military satellite communication systems. Yes, that works out to nearly \$300,000 per system.

**ORION**, not related to Oak, has received final FCC approval for its version of an international satellite system. The FCC approved plan

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Videocipher scrambling system has not been what the company hoped.

**USSR** and Intelsat have signed a preliminary agreement whereby both of these operators of semi-competitive international satellite systems will begin to share information and possibly services.

**AND**, Russian problems with the Salyut-7 space station were recently 'covered up' during direct, live television broadcasts to Russian viewers (and others watching internationally on gorizontal). The space station apparently had severe (cold) temperature problems and, during live telecasts, Cosmonauts took off extra heavy clothing to hide obvious chill inside of vehicle. The price of being a TV star, even in space!

#### COOP/ continued from page 6

of course, fosters innovation.

**Keith Lamonica is an angry man.** His anger seeps out of your TVRO speaker each and every night, seven nights a week, when you dial up Telstar T303 and transponder 18; 6.2 MHz subcarrier audio. Lamonica is in charge of **'FM America,'** a strange and even bizarre assortment of voices who call in from all across America to vent their anger on a wide range of subjects.

FM AMERICA hit the airwaves in July. Lamonica is either very bright or very lucky. He has some sort of business going providing background type audio (music) on the 6.2 MHz subcarriers of TR18 (he started back on D3 when it was working and transferred to T303 when it activated in August). Somebody, we suspect it is not Lamonica but have no evidence to back up that contention, is footing the bill for this audio music service. In theory, somebody out there in America is paying money **to use** that background music. Maybe it is in Safeway stores and elevators someplace; we can't be sure who uses it, or why they would use this particular service rather than one of the several dozen others now on satellite.

**For three hours each night**, from 9 pm to 12 midnight eastern, FM America 'breaks away' from the music format and becomes a 'talk radio' program. The lucky or bright part?

Somehow Lamonica has been able to arrange for a 'billboard' on video to go with his audio. Let's face facts: if you or I ordered up an FM subcarrier on an obscure satellite and on an obscure transponder, we'd probably languish for months trying to make people 'aware' that we were there. Not that many people cruise around obscure satellites and transponders with their audio subcarrier system in a 'seek mode' searching out unusual audio services.

**The video billboard stops people;** as they scan the skies looking for something to grab their attention, the Lamonica billboard does this. It takes just a few seconds to read the billboard, and then find the 6.2 subcarrier to listen in.

All of this costs money. You can rent a fulltime (24 hour per day) audio subcarrier these days for as little as \$2,000 a month. Alas, that is

allows 2 satellites totaling 46 transponders (36 MHz wide, nominal) 11.45/12.20 GHz downlinks for North America while 11.45/11.70 and 12.50/12.75 GHz downlinks will be used in Europe. The birds will be at 37.5 and 47 west with only 10 watt transponders as licensing condition.

**HI-NET** system, on the Gstar 1 bird, has opted to buy the S/A scrambling system rather than the M/A-Com Videocipher system. Hi-Net is now operational with up to 5 transponders on Gstar, Uplink will be from new broadcast center in the Memphis area and the first scrambling units are scheduled for delivery early in 1986.

**M/A-Com** in market selling \$75M (US) in 'debt securities,' reports the sales are 'for general corporate purposes.' Progress in selling the

just the opening cost since you have to somehow get a signal to an uplink and then uplink to that transponder. Add another \$3,000 to \$8,000 a month for this part of the circuit. And if you add video? Yes, it costs nearly as much to throw up a 'billboard' as it does to throw up moving pictures.

You can rent a full transponder, **video and audio**, for just over \$93 an hour, but you have to take 24 hours a day, 30 or 31 days a month to get this 'low' rate. That comes to nearly \$70,000 a month. So what starts out looking 'cheap' at \$2,000 month for a fulltime 'audio' subcarrier quickly becomes a much bigger number. That's why more people haven't done it.

**Lamonica doesn't explain how he can afford all of this.** One must deduce that he is not paying full tariff for what he gets, that somehow he has a 'special deal' worked out with somebody since on the surface his FM America program carries only limited 'advertising.' Those from our industry who have agreed to 'support' FM America on the air have been sending in \$1500 checks for the right to advertise. With most radio 'stations' you sign a contract, agree to a per-spot rate, and then the radio station supplies you with a notarized affidavit attesting that within some time frame such as a month, they did indeed run the agreed to number of spot announcements. You pay your bill based up that notarized and sworn statement. Not with FM America.

Lamonica, as we reported in **CSD/2** for September 15th, was in Nashville. He received some recognition for his presence (the SPACE Board of Directors gave him a verbal pat on the back) and during the day he broadcast from the **Conifer Corporation** booth. At night, he retired to room 5518 where he had set up a small remote-studio. Various people from the industry dropped by the studio to go on the air with Keith.

The 'format' on FM America is that Keith opens up his telephone lines (he had four operating in Nashville) to the listeners. The listeners pay their own long distance charges for the privilege of going on the air.

**"Those guys at SPACE are double-dealing, rat-finks,"** says the voice on the telephone. **"First they tell us they are fighting to keep scrambling from happening, and then they turn around and go into the scrambling business with this Viewers First thing. This whole thing stinks!"**

Lamonica leans back in the chair and a broad smile comes over his face; the smile of a Cheshire Cat who has just cornered a rat in a compromising position.

**"Let me make it very clear** that I am not condemning SPACE or Rick Brown, at this point," protests Lamonica. **He**, of course, doesn't have to condemn SPACE and Rick Brown; **his listeners are doing it for him.**

"Lamonica started out green behind the ears, but seemingly willing to learn what TVRO was all about," remembers Dealer Board member **Tom Harrington.** "He didn't have a TVRO, and apparently knew very

1/ Another CommTek publication, **Orbit**, uses their September issue to editorialize **to consumers** on the question of who is to control TVRO viewing. Under the title of **'Time To Fight Back,'** publisher Wolford writes **"It is time to mobilize the people who stand to lose the most in the battle for control of the airwaves—the home satellite system owners."** So we have **Orbit** urging viewers to inundate Congress with a strong anti-cable message, **Satellite Dealer** urging dealers to fight cable, and **SATguide** urging cable operators to take over control of TVRO distribution and sales. Apparently the message here is 'The hell with convictions, print whatever makes the most money!'



little about TVRO, the history of TVRO, or how this industry works."

Lamonica has an engaging style, a reasonable wit, and he well understands how to pluck people's emotional harpsichord strings. We appeared 'on the air' with him in Nashville one night, and watched his handling of 'nut calls' firsthand.

"**Every crazy in the world calls him,**" observes Harrington. "You hear the most outrageous statements on the air, and most of them go unchallenged by Lamonica. It is as if he either does not care for facts or he simply does not understand the facts. The program has changed from a collection of inexperienced callers who want information to a collection of malcontents who wouldn't be happy if HBO personally came to their home and hooked up a free descrambler for them. **It is unreal!**"

Lamonica complained to us, and to his listeners while in Nashville, that he was not getting the **advertising support** of the manufacturers. "They all pat me on the back and tell me what a great job I am doing, **but not one new firm agreed to advertise with us** while I was here (Nashville). I don't understand it!"

Listeners, as emotional as ever, poured out their pledges of support. \$20 here, \$10 there. Some send in far more than that. Lamonica has discovered a new form of 'satellite evangelism.'

"**Perhaps it is time for 'membership' in FM America to represent the consumers—the viewers out there,**" suggests Lamonica during a lull in on-the-air conversation. He is suggesting **he**, and FM America, can fill in for SPACE since it is 'now obvious to all listeners' that SPACE has sold the consumers out by becoming 'involved in this Viewers First scrambling thing.'

The concept of being on the air, nightly or perhaps five nights a week, to reach out and touch TVRO consumers, is a good one. Several people are kicking themselves for 'not thinking of it first.' SPACE is kicking itself for not thinking of it. Several groups, including SPACE, are trying to find the 'special, good deal' which Lamonica apparently has found so that they, too, can be 'on the bird' to 'talk with and to con-

sumers' on a regular basis.

Lamonica, if he continues to be able to cover his costs, seems to have reached a 'marketing decision' of his own. He apparently feels that his 'marketing nitch' is to interface with TVRO consumers and somehow position himself as 'their representative.' Who would he represent the consumers to?

"**How did Viewers First arrive at the proposed \$7.95 per home, per month charge?**" Lamonica asks of VFN's **Sandy Wirth** on the air. Wirth tries to explain that Viewers First takes **their cost** per home from SelectTV and **marks it up** to cover their own marketing costs, and adds a reasonable profit. Wirth points at the HBO \$12.95 per month charge as an example of an 'unreasonable profit.'

"**But that is not negotiation; you are not negotiating with anyone.**" hammers Lamonica. Wirth responds that in 'marketplace negotiation,' there is a willing buyer and a willing seller. The price is arrived at when the willing buyer agrees that the fees asked by the willing seller are fair and represent proper value for the product in question.

"**Nobody negotiates then,**" snaps back Lamonica. "You guys simply **tell us** what the charge will be and **we either pay it or walk away!**" Wirth says that's how America operates. Lamonica leans back in his chair and smiles that Cheshire Cat smile again.

Lamonica wants to be 'the negotiator.' He wants to be 'the guy who speaks for TVRO consumers,' all 1,000,000 plus consumers. And he is using **FM America** to position himself as that spokesman. He sees big bucks out there and right now it serves his interests best to keep the pot stirred and the fires burning intensely.

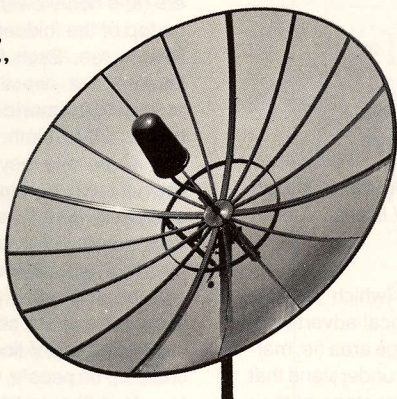
"**I think he will burn himself out; perhaps within sixty days,**" suggests Harrington. "He is taking on the whole world, the established dealer and supplier world. He is suggesting that SPACE is no good, the industry leaders cannot be trusted, everything about TVRO is bad; **except for him.** And the mis-information being spread around on the program; I hate to think how many people may be tuning in and believing even a small percentage of what they are hearing!"

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F.D. RATIO ..... .33  
FOCAL LENGTH ..... 40"  
GAIN ..... 40.1 D.B.  
FINISH ..... BLACK

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Lamonica is certainly controversial. His motives are only known to himself and those who feel threatened or attacked by his rhetoric or the rhetoric of those he brings on the air will find as many reasons as possible to 'ignore' FM America. What remains to be proven is whether or not these tens of thousands (according to Lamonica's claims) of daily listeners will also turn off FM America and ignore what is being said.

#### HOW WE 'Pay'

With all of the debate one hears now on programs such as 'FM AMERICA' concerning the public's 'right' to free, unscrambled television, I thought some perspective on who really pays for television might be in order.

There is no such thing as 'free' television. Over the air, broadcast television is not free and it never has been. First of all, the viewer buys his receiver. Even given depressed receiver pricing and large American wages, the television set is not yet in the same category as a disposable can opener.

But the real cost to the viewer is for all of the products and services which **advertise** on television. We all know, and accept, that firms which elect to advertise on TV must increase their selling prices to offset the **cost** of advertising. What we may not understand is just how significant this increase in selling price may be.

**Ten years ago** I did a detailed study on the cost-per-home of television advertising. I published those study results and we found that in 1975, if you lived in Reno, Nevada (chosen on purpose because it is a 'small' TV market), your home was paying an average of \$280 per year for goods and services advertised on television. We arrived at that number through a very simplistic approach:

- 1) First you take the (FCC reported) **total gross advertising revenues** for all of the (Reno) market TV stations, and
- 2) You divide those dollars by **the number of homes** in the (Reno) market.



**BATCHELORS Cup-Of-Soup** merchandises its products by offering to help TV viewers pay a portion of their 'TV license' fees in the UK.

Through a combination of network advertising (which stations 'share' with the network), regional advertising and local advertising, the station receives income. Each home in the coverage area (ie. market) buys goods and services and since we know and understand that all goods and services advertised include some percentage of their total 'cost' for advertising of the goods and services, we can arrive at a 'cost per-family per-year' for their goods and services, attributed to television advertising.

\$280 per year in Reno; other markets ran to over \$400 per year. In a very real sense, when a television station 'sells,' it is not the collection of equipment (and personnel) that is being sold; it is the 'cash flow'

revenue-producing value of the station. There is also a direct nearly identical relationship with cable television; if a home averages \$20 per month for basic plus premium service, that home is paying \$240 per year for TV **on top of** what it pays automatically in the super market check out line. By now most of us fully understand that a cable system in today's marketplace is 'worth' approximately \$1,000 because in a normal five year pay out; that is the 'cash flow' the home will generate or create for the new owner.

So **there is no such thing as 'free TV'**; there never has been. Each can of soup, each car, each pair of tennis shoes you purchase has a percentage of its selling price allocated to advertising. It may not be television advertising or it may be split with television and radio and print media, but there is a cost there nonetheless. People who never watch television get no discounts; they 'pay for television' anyhow.

And we can determine with good accuracy what the increased cost of goods and services per year is for any given area (market) of the United States simply by measuring the divided-up on a per-home basis advertising revenue for TV stations in the market.



**BUT the viewer pays a price of course. He has to consume a tremendous amount of soup to get a 10 pound discount on his TV license. Suppose the Russians offered their viewers a reduction in their annual TV fee by putting coupons on their Vodka bottles!**

**This is the American system.** Not all countries work this way. In England, for example, there is a dual system of paying for TV. They also have advertising and this advertising 'cost' is shared with all viewers (and non-viewers) in the marketplace, just as it is here. However, on top of the 'hidden cost' of advertising there is also an annualized license fee. Each television set (owner) is to pay an annual 'TV License' fee directly to the authorities. I believe that amounts to around **\$90 American** at the present time which translates to approximately \$6 a month. With this dual system of financing television, the English believe they have a better system. **Every** TV viewer pays the license fee (a bureaucracy exists to insure this and special monitoring equipment which can detect a 'running TV set' can snoop out offenders) whether they purchase anything or not. Those that do not watch television still pay increased costs for goods and services because the cost of advertising permeates every product, but at least they are spared the **direct cost** of a 'TV license.'

Since the 'TV license' is an annual fee, and since it does tend to creep up on people, clever marketing people in the UK have managed to put together 'marketing packages' which are designed to sell products. In effect, the 'TV License' is a viewing tax and in England it is possible to get the help of 'commerce' to pay a portion of that tax.

**Batchelors Cup-A-Soup**, for example offers to pay up to 10 pounds of your TV License fee if you purchase their soups, save their box-back coupons, and turn them in before a specified date for a 'refund' towards your TV license. That works out to about 15% or so of



the annual fee and the theory is that if you are going to buy and use 'soup mix' anyhow, you might as well get some of your TV license 'knocked off' in the process. England is a country of coupon clippers and it works quite well.

Into this muddled approach to collecting for the costs of television production and broadcasting we have those ill-formed callers to 'FM America' who seem to be under the mis-conception that the 'public owns the airwaves.' Very naive indeed. Just because there are constitutional guarantees to this effect does not mean that 'ownership is free.'

Listening to 'FM America,' I am led to believe that (1) the public **owns** the airwaves, and, (2) the public **paid** for the cost for the space program with taxes and therefore the public should have **free access** to whatever the space program originated. Very naive indeed.

**The public has no ownership in the airwaves;** what it does have is the right, through an appropriate government created and funded agency, to have **access to the airwaves.** Nobody, and that includes the public, can own an intangible and certainly the airwaves are intangible. We (the public) gain our 'rights of access' because we (the public) adopted laws which state that the airwaves shall be regulated 'in the public interest.' No, that is not the same as 'public ownership' since the very phrase 'public ownership' is something of a statement at odds with itself. The very meaning of public is contrary to the very meaning of ownership.

Airwaves, being intangible, cannot be owned. What can be owned is what we select to **transmit** via these airwaves. Movies, sportcasts, news programs; all are created by people. And those people, somehow, have both control over their creations **and the use of** their creations. That is well founded in our copyright law. A TVRO owner is intercepting transmissions sent on airwaves regulated 'in the public interest' but the mere transmission **itself** carries no intelligence, no information. It is simply a signal with nothing contained on that signal. The guy who **puts something** on that signal, in the 'public domain' is putting **HIS something** out for use. And because of our system of copyrights, the owner of those rights is certainly entitled to 'protection' from mis-use of his products. If he decides that TVRO viewers as a category are not authorized to use his product, that's his decision. Naturally it is also his responsibility to take whatever steps as he may need to take to protect his copyrights. Scrambling is one of those possible steps and he is entitled, and protected, to exercise that right.

Copyright owners have created a complicated and little understood system of insuring payment for their products. Authors contract with publishers to print and distribute their manuscripts. The publisher may buy national (US) or international (worldwide) rights. Xerox machines installed in libraries aside, few of us would claim that we 'have the right' to walk into a 'public library' (also paid for by 'the public') and pull a copy of **2010** off the shelf and copy it page for page just to avoid paying \$12.95 at the bookstore. Yet that is exactly what we are doing with television programs transmitted via satellite; we pull them off the satellite just as we would pull a book off the library bookshelf.

The 'lunacy' of 'FM America' call-ins is that a significant number of people scattered all over America **really seem to believe** that having paid \$2,000 or \$3,000 for a TVRO, they are now 'entitled' to watch everything out there without any obligation to compensate the owners for their product. Scrambling, to these people, is unAmerican, illegal, and probably a secret 'Communist Plot.' Right on. This lunacy is compounded by host **Keith Lamonica** who either never explains how it really is, or, alternately seems to encourage this sort of illiterate diatribe over the air. I'm not so sure that the continuation of this sort of dialogue on 'FM America' makes our industry or our customers **seem** very bright. I'd hate to think that members of Congress, increasingly getting their own TVROs, are exposed to this sort of dialogue and then somehow led to believe that this sort of mentality is representative of TVRO viewers nationwide. In this situation, I hope we are hearing from the 'uninformed minority' and not the 'literate majority.'

(**Taylor Howard**, Chairman of the SPACE Board, recently remarked "I would like to **believe** that these people appearing on 'FM America' do not represent the mentality of the typical TVRO consumer; down deep, **I worry that they may actually be just that way!**")

It is the responsibility of every dealer not to 'foster' this sort of mis-conception about signals coming from satellite. There is no free lunch, there is no free television. Somehow, everything costs somebody something. The users may not always realize they are paying for something (commercial TV being our example of that) but even when something seems 'free' with no string attached nor any hidden costs, **somebody (someplace) is still paying** the tab. You either pay now, or you pay later; you either pay directly or you pay indirectly. Let's cut out this nonsense about 'free TV' and realize that TVRO is a technology breakthrough, not a social breakthrough.

#### GOOD OLD FASHIONED American Hype

When I learned that Ted Turner was actually serious about exporting some form of his CNN service into Europe one year ago, I began to think about how this service would fly in Europe. I came to a conclusion, privately and without discussing it with Turner or any of his top people; it had to be American knowhow and technology, but it should not be American programming. That was a tough decision for me to make since I would love to be able to check into a hotel in London one day and simply dial up 'CNN from home.' And so would hundreds of thousands of other American travelers.

**But American travelers are not the market here** and while having CNN available in a London or Munich hotel room would help fill some rooms some of the time, the advantage would be temporary as shortly every hotel of any stature would have it available. That would satisfy Turner's profit motivation (he's charging around 30 cents American a-room a-day for his service) but I doubted that would satisfy Turner's sense of growth. He had bigger plans, I suspected.

As noted, ENC or European News Channel is now on the air. That means European cable, SMATV and yes, home TVRO, has access to 24 hour news and special events just as we do at home. I predict it will mushroom into one of the most successful ventures Golden-Ted has ever touched.

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I sent Ted Turner a memo last spring. I send lots of people memos and my memos are legendary in certain circles. Some even start lawsuits.

My Turner 'memo' suggested a 'launch plan' for CNN/ENC. Here's how it went.

"Ted" I started it off, "you have a golden opportunity to do more for understanding of America than all of our government programs combined." I suggested that he allow me to round up ten Ku band terminals. I further suggested that he select ten people in Europe (and western Asia) whom he would like to count on as **fulltime viewers** of CNN/ENC.

"**Let's take a terminal to London** and install it for Margaret Thatcher," I suggested. "Let's pick nine other 'heads of state', people who represent their countries in the national and internal forum. **Our industry, the American home TVRO industry, will supply the equipment** and the manpower to install these 'Ted-Turner-Gist-TVRO's for these heads of state.'" Now that I had Ted's attention (I did), I rolled up my sleeves and got creative.

"We'll put three teams of two people each into the field. Each will be allowed two work days followed by a travel day. In their two work days, they will install a terminal in an assigned country for a previously arranged head of state. At the end of nine days, we'll have nine terminals installed and the entire group of 10 will meet in Rome."

I had this vision of Turner's CNN crews following us around as we installed terminals for the heads of state in Sweden, Germany, Italy, France, and so on. I saw Turner showing up at several of these to sit in the living room at 20 Downing Street, for example, with Margaret Thatcher, to watch CNN/ENC on her television set.

After the gathering in Rome, I suggested that everyone in the group then travel to Moscow; you've got it. **We would install the tenth terminal at the Kremlin.** I suggested we get started before the winter snows began, however, since I didn't want to have people sliding down red tile roofs into Red Square because of ice on the roof.

Turner, as I said, liked my idea. He gave it his stamp of approval and passed it down a peg to a fellow who runs the day to day Turner operations. And there it ran into trouble.

"**What do you want out of this—**" I was asked. I said, "Nothing but the exclusive video and print rights to the story." I figured we'd get Turner on the front cover of **TIME Magazine** with this one. Naturally I wanted a piece of that, being the entrepreneurial journalist that I am.

Since everything looked 'go' I started talking with people I wanted to invite along on the trip. After all, who in the world would turn down an opportunity to install or help install TVROs for heads of state all over Europe? Or, travel to Moscow to stick a dish on the Kremlin. Big time stuff. I mentioned the equipment part to several suppliers. Each wanted to supply 'all 10' terminal packages so I had to put my foot down and point out that however many terminal suppliers we had participating, we'd split the equipment up as fairly as possible so everyone who wanted to be a part of this could do so.

After a fast track start, the project suddenly jumped tracks in May. I had flown up to Atlanta to meet with one of Turner's people and after this meeting I knew we were in trouble.

My original proposal was that the entire group (9 total or so including us 'press people') bivouac in Atlanta a few days early where we would get a thorough schooling on how to install the various pieces of equipment, and be pre-briefed on heads-of-state 'etiquette.' I had a couple of dealers selected, and some suppliers. Turner's people were originally going to pay the costs of travel and lodging. **That was my first mistake.**

I suggested that with their tremendous 'advertising power' at Turner, they could 'trade out' the lodging and travel for airtime within the Turner network. In the broadcast biz, people swap or trade 'air time' for goods and services all of the time. This is called 'barter' and it is an important part of broadcast life.

One of Turner's people developed the feeling that the group would

be 'dangerous' on their own, and he was not ready to spring for the travel and lodging costs even if it turned out to be essentially free, by barter. So back to square two.

**Another problem perceived** by the Turner people was the 'small American Army' that would 'invade' Europe with four to six foot dishes and electronics in tow. "**It is just another example** of the 'Ugly-American' telling the Europeans what to do and how to do it!" I was warned. Since my whole concept was that the '**American TVRO Industry**' would be on stage here, we wanted to use this opportunity to show off our **American technology**. The listener, a Turner guy, didn't respond to 'the flag' as I hoped.

So the project drifted into oblivion. That didn't stop Turner's people from coming back to me several times to arrange some contracts within Europe. They wanted to use European equipment and European installers for some selected TVROs, and, 'would help?' I did, of course.

Then in mid-September I had a pair of calls in one day from Turner people. "If we can eliminate the **large** American contingent and if everyone will pay their own way, the project is back on," I was told. I knew the alternative was that **they would find somebody else** to oversee the project. I felt obliged to accept their terms since it was obvious that Turner was going to 'run' with my 'launch idea' after all. I didn't really care if Ted made the front cover of Time for his effort(s) of course; I hoped he would.

As I prepare this, the details are falling into place. There could still be some hitches and it still may not fly, of course. What I don't want to lose control of here is the 'image' that **TVRO was born and created in America** and it is **a gift of the American TVRO industry** which will be making it possible for ten leading European heads-of-state to have fulltime access to American television journalism'. I think that is a pretty strong message and as the project matures we will try to keep you up to date both here and on BORESIGHT (1).

#### TURNER Spells CNN 'ENC'

Ted Turner's fantasy to operate a **worldwide television network** came a step closer to reality September 30th when he staged a London 'inauguration party' for his latest conquest; the continent of Europe. Turner's CNN, long scheduled to arrive in Europe on September 15th, began testing on that date and after two weeks of testing the service took off with a gala celebration late on September 30th. Europe may never be the same.

Turner's plans were kept under wraps until close to the end; first, they had announced, CNN would go to Europe for use by SMATV and cable systems. CNN, the 'American' version, was going to be transported intact from a new Atlanta uplink (6 GHz up) to an Intelsat satellite situated at 27.5 west. There, because this is one of the new 'V' series birds, the signal would be 'cross-strapped' internally from the 6 GHz uplink to an 11 GHz downlink. Normally, signals that go up at 6 come down at 4 (those that go up at 14 come down at 11). Turner wanted to get into Europe, and onto Ku band, the least expensive way. He rented/leased a full Ku band transponder (54 MHz wide) from Intelsat for this purpose. He is using half of that transponder (27 MHz) for his new 'ENC' service. **ENC?**

That was part of the 'surprise'. ENC loosely translates 'European News Channel' and to back it up, the second part of the surprise; **a brand new studio in Atlanta** which is devoted totally to operation of the ENC service.

Rather than take CNN or CNN/2 or some mixture of the two into Europe, with all of that 'American' flavor, Turner looked into his crystal ball and decided that with the rapid growth predicted for cable and SMATV in Europe, his best of chance of 'competing' with other prom-

1/ BORESIGHT TVRO Program airs each Thursday at 9 PM eastern time, F4, TR20.



ised all-Europe news channels was to, in fact, be Europe (an). ENC fills that need and while you will have to travel to Europe to view the service, it features an entirely new on-air look which can best be described as 'Pan-European' in scope. Nobody is likely to accuse Ted of being 'just another Ugly American' when they view this exported service.

Turner aides have been nervous for many months about the launching of CNN in Europe. They have also been slugging it out on European turf with the regulators of European telecommunications; people who can turn thumbs down and keep Turner's service out of hotels, condominiums, apartments and communities all across Europe. One of Turner's reflex actions when presented with this possibility was to tailor 'ENC' so it looked only slightly 'American'.

ENC consists of three distinct 'parts'. With a 24 hour day to work with, and with the 'center' of Europe running 5 and 6 hours 'ahead' of Atlanta (local time), there were serious reasons why CNN might not play well long term, after the novelty of it all wore off European viewers. By taking day-parts out of CNN, other day-parts out of CNN2, and then molding it altogether with a custom service from new 'ENC' studios, and backed by a dedicated ENC staff, Turner's new European service speaks 'European' with no more American 'accent' than necessary.

Turner's acquisition of a full Intelsat transponder, but his decision to only use half of it at this time suggests that down the road he has ample room built into his European service to expand by 100%. A task force has been studying how (and when) to best utilize that additional transponder capacity. For the moment, any service that sounds or looks too much like it is 'American' will probably not get serious consideration. Turner's people realize that if they can resist the temptation to create another American channel, but rather stick to employing proven American programming and production techniques with a keen eye on who the audience is, they stand a far better chance of commercial success.

#### ACCEPTING Advertising

In this great race to control and direct men's minds concerning scrambling and fair scrambled program pricing, there is the action of the programmers themselves to consider. CNN and others now routinely advise viewers with private dishes to send money or risk being "illegal." I understand they are measuring their \$25 checks in 'hundreds' rather than thousands at CNN. That doesn't suggest to me that alot of people feel as obligated to pay as CNN would like you to believe when you absorb their message on the air.

To reach viewers more directly, CNN, Showtime, HBO and others have created some print-media advertising. This advertising is designed to appear in the various satellite program guides and a handful of the satellite dealer publications. CNN and HBO, for example, are using the same (Atlanta, Georgia based) advertising agency to create these 'infor-mercials.'

The advertisements tell readers basically that same thing which CNN and ESPN on-the-air messages tell viewers. That, in the view of CNN (et,al), watching their programming is illegal unless you send money. Even if they are not yet scrambled. They cite the 1984 legislation as their legal foundation for their payment requests.

When the Atlanta advertising agency first contacted the various publications concerning scheduling these ads, there was an instant hiccup in the TVRO publishing world. "Should we accept their advertisements?" each publisher pondered. SPACE quickly said they could not and would not advise publishers on this matter although they would be 'pleased' if the publishers did not run the ads. What SPACE would riot do, several suppliers did do. Somehow alerted to the pending advertisements, several of the major hardware suppliers called around to advise the individual publishers that "If you accept and run those advertisements, you may never see an advertisement from us again..." Yes, that sounds like coercion to me, also.

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ELECTRONICS INTERNATIONAL  
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## 10.525 GHz Microwave System

The Westplex portable microwave system is a budget priced FM link operating at 10.525 GHz. The system is capable of transmitting NTSC color video, plus an audio channel and an optional duplex phase or dataline. 40 miles are realistic using an optional 2 ft. dish at each unit. Other options include a remote RF head, AC/DC operation, 35 mw or 50 mw output.

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(206) 428-2810



On the surface, the CNN et al advertisements are not **that displeasing**. You've probably seen several by now. CNN and SPACE do **not agree** on two things, as we all know:

1) They don't agree on whether or not a service such as CNN can arbitrarily set rates (\$25 a year for two services); SPACE says the 1984 law, and the debate in Congress before the law was passed, clearly states there must be 'marketplace negotiation' of rates.

This was, of course, Keith Lamonica's question on 'FM America.

**"How can SPACE say the CNN rates are not fair without marketplace negotiation, and then allow Viewers First to step in and TELL us that their rate is \$7.95 per month? Where was the negotiation with Viewers First???"**

2) The two do not agree on the rate itself; CNN says that the rates are very fair (see CSD/2 report on the Brown/Effros debate for September 15th) while SPACE says they are 1,000% too high.

Accepting an advertisement in which CNN and HBO (and others) 'state their position' to our consumer world is in effect providing space for a 'paid editorial.' Some have likened it to accepting political advertising during a heated election campaign.

On the other hand, if we are **really** in a 'war' here, a battle for survival and ultimate 'independent (control) of TVRO retailing,' why should a publication totally dependent upon the present TVRO industry for its livelihood provide even a forum for the guys who seem to be boresighted on taking us apart and killing us off?

**I have a suggestion**, as I often do.

I believe that we can arrive at a formula which determines the amount of 'page space' consumed by the programming advertisements in all of the program guides and dealer publications in a given month; October for example. Let's assume that is amounts to 0.5% (one half of one percent). Now, that same formula applied to HBO and CNN and ESPN (et al) 'air time' would tell us how many minutes per month would also equal their broadcast month at 0.5%. It works out to 3.6 hours per month.

Now, **we will accept their advertisements** at our regular page space rates, provided **they will accept an equivalent amount of programming** which we will produce through SPACE for airing on their networks. I'll be happy to volunteer to be producer for that air time. No charge.

This gives the publishers an easy out; they get their advertising revenue and they cannot be accused of turning down advertisements which come from the enemy camp. We, in turn, get a face saving opportunity to speak directly to the home cable viewers about our plight. Everyone is treated fairly.

While you are mulling that over in your mind, a bit of history which I happen to think is important to recall.

When I published cable TV's first trade magazine ( **TV Horizons**) back in January of 1960, all of my advertising revenue was from hardware suppliers. They included Blonder Tongue, SKL, Jerrold, and others who at the same time sold cable amplifiers, antennas, and so on. By 1975, when I was publishing **CATJ** magazine, our advertising was about 95% from hardware suppliers but a new category was starting; programmers. Within three years from the HBO start in 1975, our advertising revenue had flipped; more than 50% was coming from 'software' or programming suppliers such as HBO.

Hardware suppliers had cut back, way back. They did this between 1975 and 1978 because during the late 70s the intense competition in cable hardware sales slacked off. From several dozen firms producing line amplifiers and cable, we dwindled to about five. The rest were gobbled up in acquisitions or they simply could not compete anymore with the big boys.

For the cable trade press, the rapid growth of software firms such as Showtime, ESPN, and others was a timely blessing. Had software not come along when it did, the advertising fortunes in CATV publishing would have dried up very abruptly. As it turned out, fortunately for CATV publishers, as the hardware advertising dove-tailed off, **the software advertising grew** so the net change was only slight. Today,

more than **80%** of the CATV trade publication advertising **is software**.

The day will come when the same thing occurs in TVRO; through a combination of product maturity (i.e. state of the art, final designs are reached with the hardware) and dealer network maturity (believe it or not, someday 'part-time installers' will go away!), the need to promote heavily will disappear. Advertising budgets will be slashed as OEMs look for better ways to control expenses, or methods of retaining profit margins in the face of increased competition. There won't be 30 receiver suppliers and 50 antenna suppliers; there will be ten or fewer of each. Software advertising, is different however.

**Every new day, every new month brings new software. Each new piece of software (whether a new network, a new marketing scheme or simple a new program series) will need to be 'announced' and 'promoted.' And in this great transition we'll see our myriad of dealer magazines run into hard times and those that survive will emphasize away from equipment and towards programming. Because programming, software, is where the bucks will be.**

So it takes special guys today to be in the guide business and to turn down the first, leading edge of programmer advertising from the software people. I suspect that these software people will have long memories, that in addition to passing up a few thousand quick bucks **this month** by refusing to accept their advertisements, the publishers who have turned down these CNN et al advertisements may be in a difficult catch-up posture a year or two from now when hardware advertising begins to dwindle and software advertising comes on strongly.

I'm not the only guy who sees this, of course. Any publisher in our field with any sense of history and common sense at all realizes what is happening and what will happen. So it takes special guts, and a special brand of dedication, to stand up **today** and say **'No thank you, I will not accept that CNN (HBO, etc.) advertising because I do not believe it is in the best interests of our industry!'**

Several years down the road, it will be the software people who rule our world. Hardware, then mature and then no longer exciting, will have taken a back seat to the real product we have been 'selling' all along; entertainment, education, enlightenment. What appears on the tube and in the speakers is what TVRO is **really** all about and those who forget that 'focus' now will pay a horrendous competitive price years from now.

#### **POLAR-FEED Update**

In our report concerning the events at the Nashville Show in the September 15th issue, writing about the events at the Nashville show, we noted that **Eugene P. Augustin** had been granted a patent which, on the surface, seemed at odds with an earlier patent granted to **H. Taylor Howard**. At question are the 'origins' of the Polarotor feed device system.

When we met with Augustin in Nashville, he handed us four typed pages which related 'his version' of the 'invention of the Polarotor'. His version has him inventing it, subsequently granting a license for manufacture to Boman Industries, and then Boman and Chaparral going 'at it' in federal court over who had the right to the device. We filed those four pages away for additional research.

Augustin said to me: **"I would like to meet Taylor Howard** and talk with him about licensing Chaparral for my patent." He mentioned that he had already licensed Boman; a fact I knew. I found Taylor and asked him if he would talk with Augustin. He was willing, so I set it up using a corner of the Nashville 'press room' early one morning. The two, it would turn out, **had not met previously**. The meeting went smoothly and Augustin repeated his offer to license Chaparral. Taylor said he was interested — but since this was the first time he had seen the patent, he would have to study it and talk it over with his Chaparral 'partner,' **Bob Taggart**. Taylor noted: "I see value in the combination of the two patents (his own and Augustin's) since between the two, we can put a stop to these 'off-shore' copies (he actually mentioned a



couple of countries) which are nothing but junk, trading on our creations."

I mentioned that Augustin had previously licensed Boman Industries. Since Chaparral and Boman continue to this day to argue in federal court about who did what to whom, I thought this might present a problem to Chaparral. I felt Chaparral might not be interested in being 'co-licensed' with Boman for the same patent rights. **I was right** and Taylor said that Chaparral would probably not be interested in taking out a license with Augustin if Boman had a similar licensing arrangement. I understood that one; Boman and Chaparral will probably never walk down the aisle together.

Days, no, weeks later the entire discussion seemed to have gotten no further. Chaparral had obtained a copy of the patent **directly** from the US Patent Office, however, and they found an interesting 'omission' when they compared the copy supplied by Augustin in Nashville.

A line had been omitted in the final patent grant. The line stated that on April 02, 1985, Eugene P. Augustin had **'assigned' his rights** in the patent to **Boman Industries**. In other words, after April 02, whatever cash or commercial value that was attached to the patent belonged not to the inventor, Augustin, but to the primary licensee, Boman Industries.

This information was not present on the patent copy handed out by Augustin in Nashville. In effect, it appeared he had no real right (except as a possible agent of Boman) to be 'negotiating' with Chaparral (Howard) in Nashville; **he no longer owned the rights to the patent**. After discovering this 'oversight,' Taylor remarked, "had I known this, I would still have had that discussion you arranged with Augustin, but I would have handled it quite differently."

I didn't ask and nobody volunteered, but as I see it, if the Augustin

patent is **valid**, Chaparral will either have to: (1) contest it in court, (2) pay the owner, Boman, some royalty fee from the date of the patent grant, and/or (3) change their own Polarotors where they are in conflict with the 13 patent-claims granted to Augustin. I'd guess that the least likely scenario of all is Chaparral routinely sending royalty check to Boman. Somehow in all of this, the inventor (ie. Augustin in the most recent case) always seems to get the short end of the stick. The only winners here will be the attorneys.

#### 'ELENA' No Test

Wind tests, simulated hurricanes and other man-created systems designed to push TVRO antenna vulnerability to the brink of disaster were big topics in both editorial and advertising layouts during 1984. **Paraclypse** ran a two-page layout which showed screen mesh antennas being subjected to hurricane force winds coupled with thousands of gallons of wind blown water. The ads said the antennas survived.

**Hurricane Elena** ripped into the coast of the mid-Gulf over Labor Day weekend. When the giant storm finally went ashore, the last thing very many people worried about was TVRO antennas. However, the fifth storm of the current season spent several days 'practicing' before it finally moved into downstate Alabama/Mississippi/Louisiana, and in that practice, there was the opportunity to learn a great deal about TVRO antenna survival.

Elena was unpredictable and a tease; it lingered just off the west coast of Florida, with the indicated eye north of Tampa/Clearwater, for an excruciating 40-plus hours. For more than 30 hours, winds between 70 and 75 miles per hour lashed away at everything taller than

Continued on page 76

# Stop Losing Sales to Terrestrial Interference



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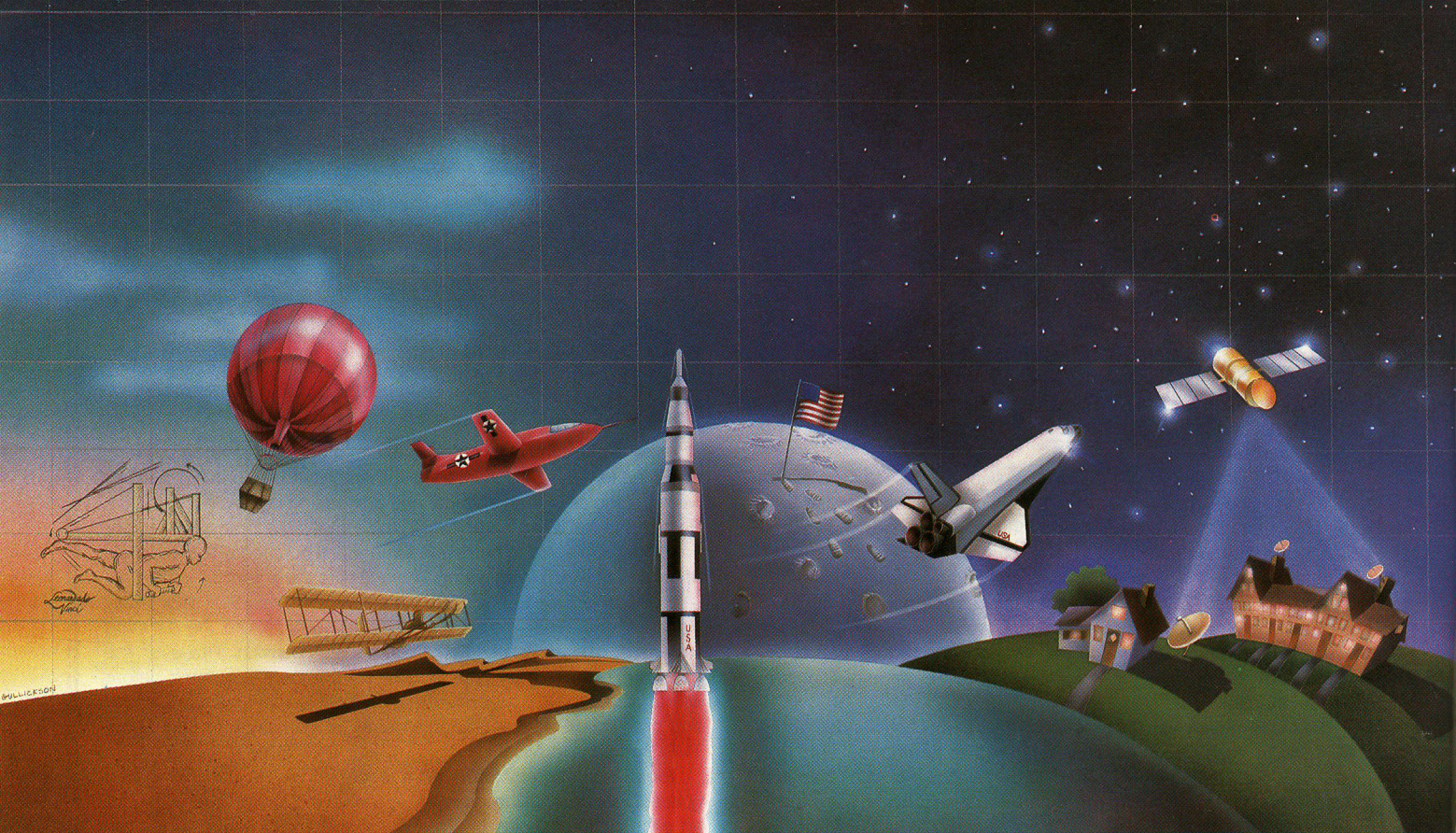
## Don't be fooled by outrageous claims and empty promises.

Call our toll free number before you attempt any installation in a terrestrial interference path. We will give you easy to understand techniques which will help you *make money* and defeat T.I.

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Going first requires innovative thinking. Taking the risks to turn ideas into reality. Plotting the course for others to follow.

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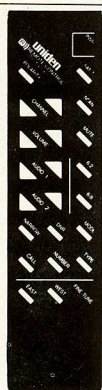
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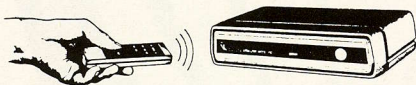




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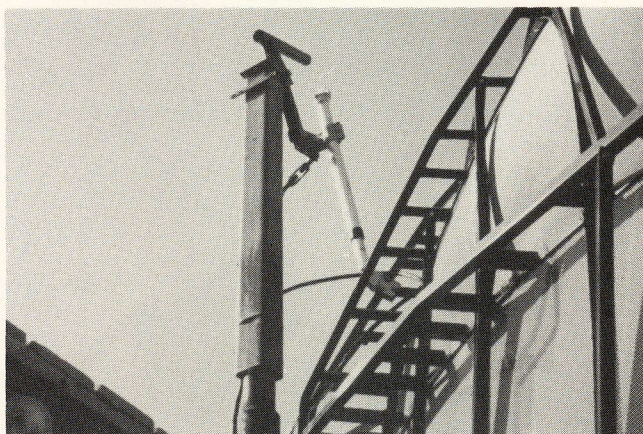
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CALL TODAY FOR MORE INFORMATION

# 1-800-272-7788

ASK ABOUT THE NEW ECI-16



**ELENA—DAMAGED** 12-foot Paraclypse antennas typically separated from their mounts after more than 30 hours in sustained 75 miles per hour winds.

a seashell. It was this extended battering of winds, just under and right at the official 'Hurricane Force' (75 miles per hour), which provided the testing grounds.

TVRO dealer **Rick Towers of Jersey Jim Towers TV** in Clearwater (Florida) has been a solid-backer and supporter of Paraclypse mesh antennas since the antennas first became available. Rick has been selling the antennas so long that he has installed almost every engineering variation Paraclypse has created. Rick lost 18 of the Paraclypse antennas during Elena.

Towers concentrates on mid and high-end systems, and has a reputation in the Tampa Bay area as being 'the best installer' and the best 'TVRO engineer around'. **CSD** has been working on a story covering one of his unique installations for several months and is scheduled for our November issue. Rick knows his antennas.

"When the storm hit over Labor Day weekend, we were out of town. I would have liked to have been able to be on hand to witness the stresses these antennas were taking" he notes. He had to settle for traveling around after the storm, photographing and picking up the pieces. He continues:

"One of the main reasons we continued to handle the Paraclypse antennas, even when copies came along that would have saved us several hundred dollars per antenna, was that we believed the Paraclypse testing done and documented with advertising copy. **We believed the dishes were strong enough to take the punishment of a hurricane.**"

And the 18 antennas that did not survive?

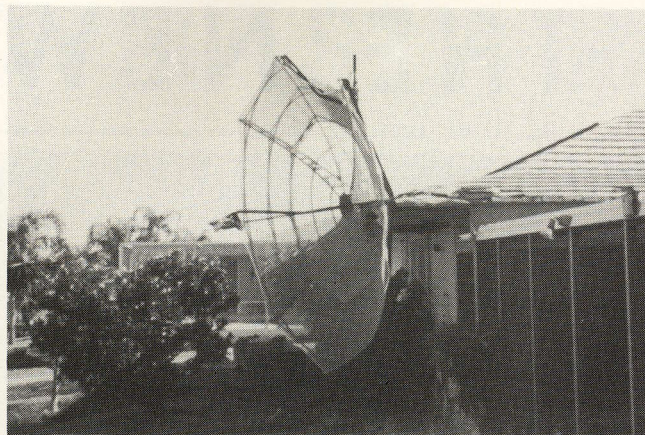
Those that failed had two things in common; first, they were all in a certain geographic region, near the coast and where the winds stayed over 70 miles per hour for more than 30 hours. Second, each antenna that failed in this region failed in the same way; the dish simply 'lifted' off the pole mount and blew away. The dish surfaces were damaged when they ran into something, like an edge of a roof or the ground. The clips stayed in place, the mesh stayed in place."

The mounts which suffered the damage were **not** of the present mount "generation." Towers reports that early Paraclypse mounts, along with the present series mounts, survived OK.

In that series of mounts, the theory was that a heavy piece of stranded wire would catch and hold the antenna if it somehow worked loose on the mount. It did not. When the antenna worked and worked OK for some 30 hours plus, metal fatigue finally occurred. Hardware snapped and the dish apparently lifted from the mount and dangled free."

"At first I was very upset because I felt that an antenna tested for hurricane survival **should survive** a hurricane! Then, I realized that

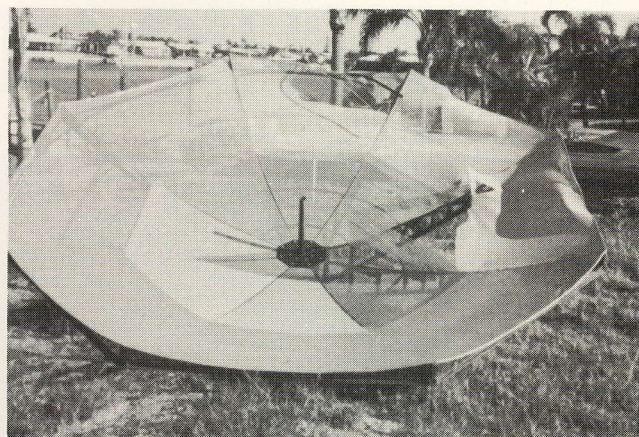




**SOME** of the antennas lifted and fell into relative safety behind a roofline, inflicting roof damage in some cases....

this was a very unusual situation, even for a hurricane. The prolonged battering of the winds, 30 hours and more, **had to be a much more severe test** than simply cranking up a wind machine and tossing several thousand gallons of water at the mesh surface.

"But most of all, I was very pleased with the backup support I got from the people at Paraclipse. They offered to send down all of the repair and replacement parts we needed, promptly. All they asked in return was a set of photographs so their engineers could study where the damage was and how they might prevent it next time. Of course

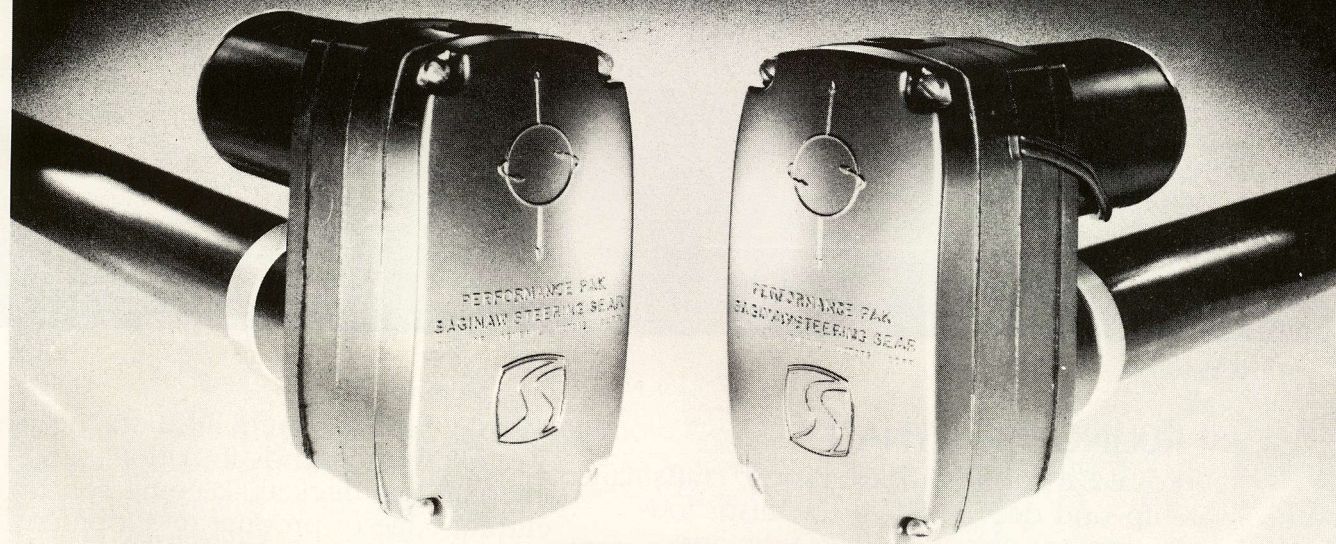


**OTHERS** flew off the mounts with enough force to land in a yard. Note that except where the mesh was damaged in the fall, the clips stayed in place and the mesh was still taut and intact.

the fact that their current mounting system did not come apart had to mean something to them."

Doubtless hundreds, and probably thousands, of other TVRO antennas were damaged by Elena. **CSD would appreciate photographs and reports** from dealers along the Gulf Coast who were faced with cleaning up after Elena, and dealer summations of the antennas and actuators which took the brunt of the storm with only minor (or no) problems.

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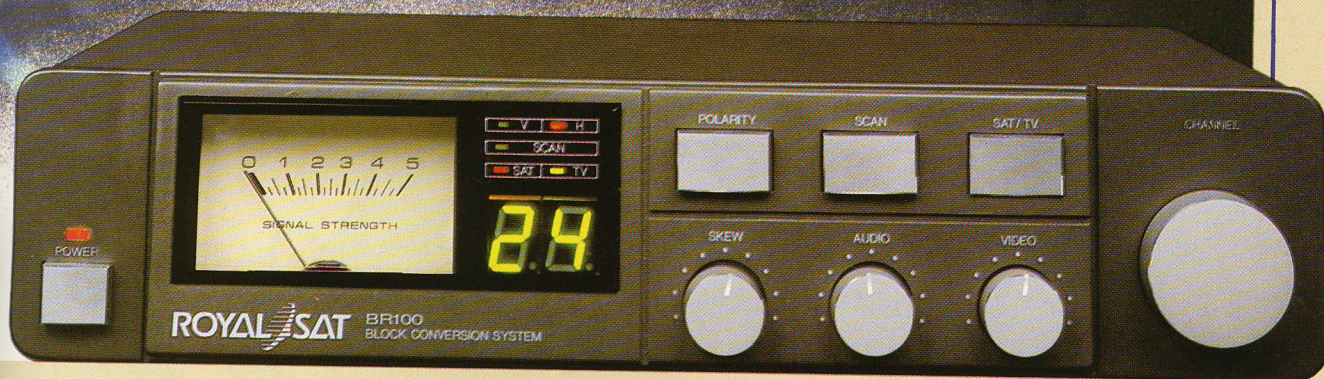
world-wide telecommunications network. We follow the trends in national and international markets, keeping *you* on the cutting edge of product development.

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Not to mention our ever-expanding line of products. The Royal Sat lineage has just begun.



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- **SATELLITE TV BASICS II**—Revised Sales-Aid—Explains Satellite TV to your customers. 14 min.
- **SATELLITE MAGIC**—Presents ALL the Satellite Programming—with logos and clips. 12 min.
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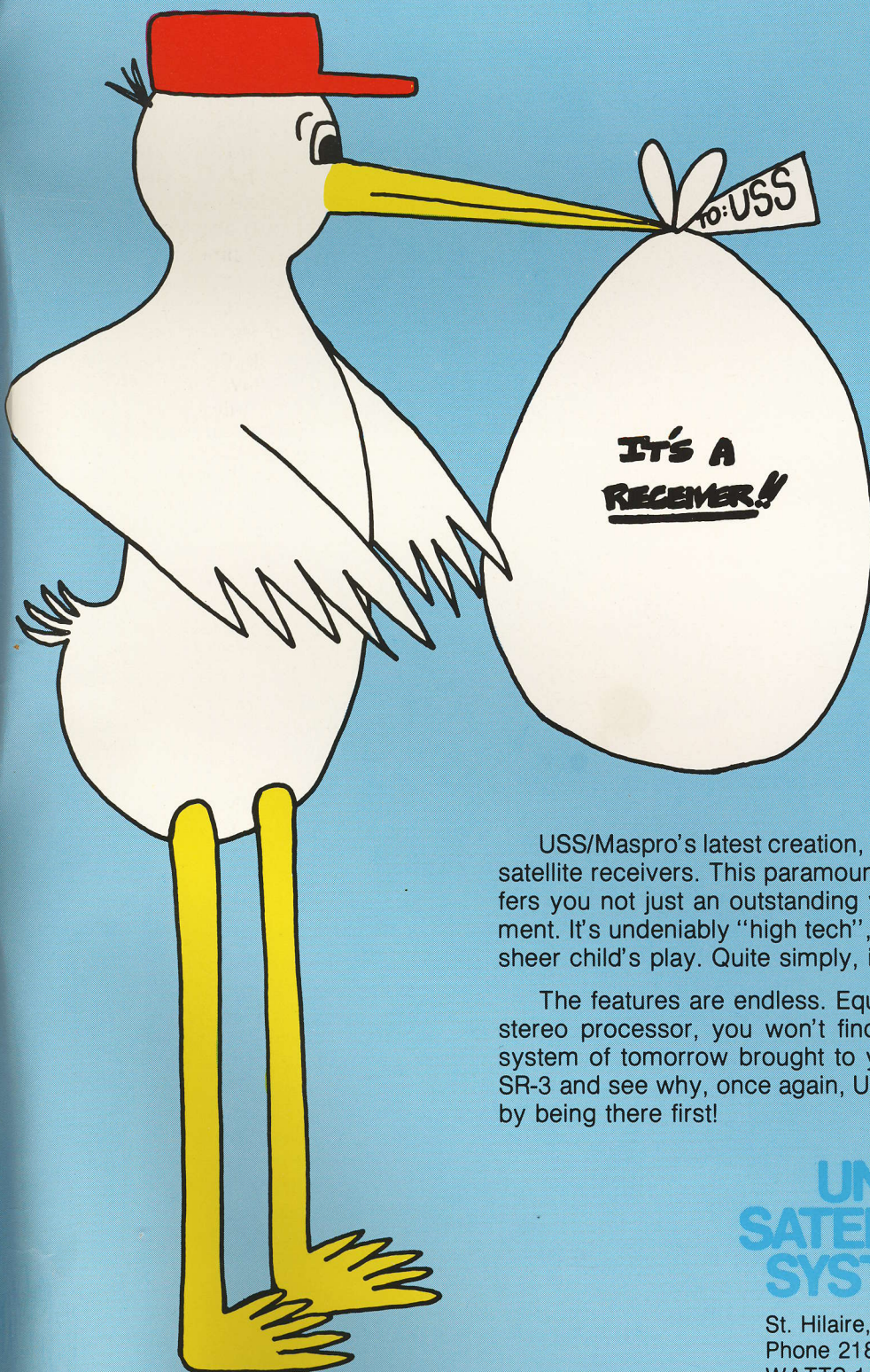
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- **Total Programming Capabilities** Allows user to program in satellite locations, frequently watched transponders along with audio levels and stereo audio modes for automatic retrieval.
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- **Selective Parental Lock-out** allows a specific transponder to be locked out for parental discretion without affecting other transponders on the designated satellite.
- **Soft Touch Controls**
- **Prima Picture Quality** 400 Mhz Linear Phase Locked Loop Demodulator has the lowest threshold in the industry affording the finest reception available.
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# SAT-TEC ANNOUNCES THE END OF THE CHANNEL WARS



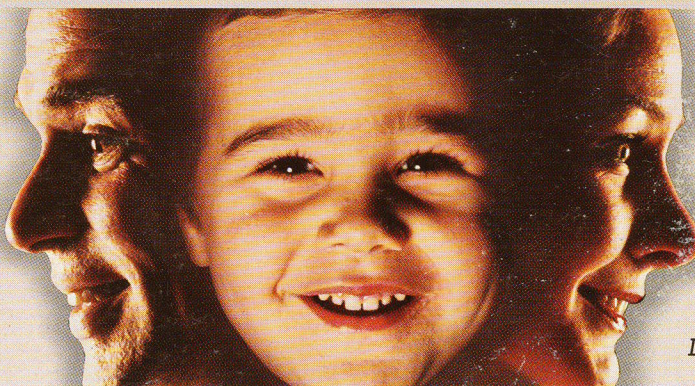
## INTRODUCING THE R-5100 BLOCK RECEIVER

Now SAT-TEC offers you a new dimension in satellite TV entertainment—freedom of choice.

At last—here's the end to the "Which channel should we watch?" debates. You can enjoy your favorite satellite TV program while the rest of the family watches their favorite satellite channel on another TV set. SAT-TEC's new R-5100 block receiver makes it easier than ever before.

### **R-5100—THE FIRST AFFORDABLE BLOCK RECEIVER THAT'S WORTH MORE**

SAT-TEC introduces the first affordable block receiver that's reliable, too. The R-5100's new-generation circuitry delivers unsurpassed performance and picture quality. And it has features you won't find on many other units, such as the convenient A/B switch that automatically switches your TV from the VHF to the dish antenna. The R-5100 interfaces with the Polarotor I™, doubling your viewing capability, and a skew control easily adjusts the polarotor for optimum performance. AGC (automatic gain control) and AFC (automatic fine tune) are standard, built-



**you watch your favorite program  
she watches her favorite program  
he watches his favorite program  
it's easy with SAT-TEC'S R-5100**

in features that insure consistently sharp and clear pictures. Circuit boards are plated through, not just on the surface, for good, strong solder joints. A built-in crystal-controlled modulator gives you additional insurance of reliable performance. The downconverter is a commercial-grade unit with a DRO (Dielectric resonator oscillator) circuit that guards against signal fluctuations due to outside temperature variations. The result is super-stable incoming signals for a beautiful picture.

### **MAXIMUM ENTERTAINMENT FOR THE WHOLE FAMILY**

If you're seriously considering investing in a satellite TV system, consider the benefits the R-5100 block receiver can offer. You have the freedom to watch any channel you want, in peace, while everyone else does the same. You can even share a dish with one or more of your neighbors, thereby minimizing your investment while maximizing your TV entertainment.

Ask your dealer to show you the new dimension in satellite TV entertainment.

Ask for a demonstration of the block receiver that's reliable and easy to own—the SAT-TEC R-5100.

# SAT-TEC

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